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CONTENTS

	PAGE
Editorial Notes	29
Steel Supplies	31
Transport Reorganisation in France	31
Some Aspects of Bogie Design	32
Loosening the Canadian Railway Fetters	32
Freight Movement on British Railways	33
Letters to the Editor	34
The Scrap Heap	36
Overseas Railway Affairs	37
Improved Facilities at Bricklayers Arms	38
Ball and Roller Bearings in Modern Rolling Stock	39
Great Belt Ferry, Danish State Railways	45
Personal	47
News Articles	49

Coal Production

TOTAL British coal production in 1951 was over 222 million tons, against 224 million in 1940, the next previous bumper year. These figures are low compared with 240 million in 1937, 258 in 1929, 276 in 1923, and 287 million in 1913. From 1942 onwards, moreover, annual totals have included a proportion of opencast coal—about 5 per cent. in 1951. The increase in output per man-year, however, at 303 tons in 1951 reached prewar levels, and the number of men employed rose; but two-thirds of the advance by 7 million tons in deep-mine production was achieved by overtime working, which may be hard to extend. Rearmament also will intensify competition for labour. Production in 1952, therefore, is unlikely to increase at the same rate as last year. The Chairman of the National Coal Board, Sir Hubert Houldsworth, points out that coal consumption in Britain is likely to grow, and this, with the present output of coal, restricts exports; yet exports must be increased as quickly as possible. The table below gives total coal output in relation to coal class traffic originating on British railways in recent years. Free-hauled traffic adds some 7 per cent. to total tonnages.

Year	Total coal production (millions of tons)	Coal, coke, and parent fuel traffic originating (not free- hauled) (millions of tons)
1935	222	187
1937	240	188
1940	224	177
1945	183	143
1950	216	167
1951	222	170 (estimated)

As coal class traffic originating includes movement of coke from coking plants, and some reconsignment of coal, it must be greater than the amount moved by rail from mines. Thus for 1951, the latter is estimated at 168 million, against total rail movement of 183 million tons. The table shows how the proportion of coal mined which results in traffic for the railways has decreased since 1935. Diminution in coal exports has caused a re-orientation of coal despatches within Great Britain and increase in ton-miles, and not in reduction in traffic originating. The amount of coal road-borne, however, has greatly increased—it is estimated as 24 million tons for 1951; and the policy recently has been to consign more coal by road so as to spare the railways.

Road Haulage Industrial Relations

THE extraordinary difficulty of the staff problems confronting the Road Haulage Executive on its formation, and largely overcome since, is outlined by Mr. S. E. Raymond, its Chief Staff & Welfare Officer, in a recent paper*. He shows how patchy was the trade union organisation among the staffs—except drivers—of the small independent road haulage concerns, and the then absence of voluntary negotiating machinery. Mr. Raymond explains the scope of the agreement on negotiating machinery, signed in July, 1949, and of the three wage agreements concluded in 1950 with three main groups of staff: administrative and clerical; drivers and operating manual grades; and engineering maintenance; and he describes the system of promotion, including the advertisement of vacancies, as on British Railways—and the disadvantage of the consequent delay in filling them. Features of the scheme for the training of employees are the Staff College at Watford, opened last May, and the comprehensiveness of the selection tests; in choosing British Road Services staff for training as cadets, 555 applications were considered, and of the 23 finally chosen, three were drivers. He also traces the growth of *esprit de corps* in British Road Services, the result partly of welfare and social activities. Looking to the future, he hopes for "a properly measured and controlled incentive" to replace the traditional hourly rate of pay.

Overseas Railway Traffics

THE advance in Canadian National operating expenses continued during November, when the increase was nearly six times greater than the improvement in operating revenues. Operating revenues amounted to £18,035,000 and expenses rose by £2,233,000 to £16,772,000. Net revenue at £1,263,000 was down by £1,830,000 and the aggregate total for 48 weeks is £4,379,000 lower at £13,799,000. Canadian Pacific working expenses for November were £1,551,000 higher at £11,260,000 and exceeded the accompanying increase in gross earnings, so that net earnings fell by £613,000 to £1,378,000. C.P.R. aggregate net earnings since January 1 were £7,913,000, as compared with £11,054,000 for the equivalent period of 1950. During October there was a £30,311 advance to £72,767 in Midland Railway of Western Australia traffics and, as a result total receipts for the current 18 weeks have improved by £89,350 to £242,663.

Last Train to Greenore

THE Dundalk Newry & Greenore Railway drew more crowds to see its passing on New Year's Eve than patronised it during its seventy-eight years of life. It was a company-owned system in which the B.T.C., as successor to the L.M.S.R. and L.N.W.R., held all the shares, and it retained strong North Western characteristics. Although even before the Partition of Ireland it was never a highly profitable venture, and the London and North Western never saw a return on its capital invested, the setting-up of a customs barrier between North and South, which truncated its Newry-Greenore line, was a blow from which it did not recover. After 1926 passengers were not car-

* "Industrial Relations in the Road Haulage Executive." A paper read to the Beds. Cambs. & Hunts. Section of the Institute of Transport, January 9, 1952

ried on the connecting steamers from Holyhead to Greenore, and goods traffic declined so much that after 1940 one sailing a week sufficed. Traffic on the railway declined in proportion and only cattle traffic by the steamers kept it open until the war, after the rationalisation of the L.M.S.R. Anglo-Irish sailings. Five of the six L.N.W.R.-built locomotives survived to the end—one, with a coach, will be preserved—but since the G.N.R.(I.) took over the working in 1933 G.N.R.(I.) locomotives mostly worked the trains. The G.N.R.(I.) now provides passenger and goods road services in replacement, and has taken over completely Greenore Hotel, which it had operated on behalf of the L.M.S.R. and, subsequently, British Railways.

Danish Ferry Services

THE newest of the ferry services which form a vital link between the provinces of Denmark, and between Denmark and neighbouring countries, traverses the Baltic between Gedser on the island of Falster and Grossenbrode on Lübeck Bay. Previously the most direct route between North Germany and Copenhagen was by the Warnemünde-Gedser ferry. Since the war, however, Warnemünde has been in Eastern Germany, and nearly all rail traffic to Copenhagen from the West has had to go *via* Jutland, the Little Belt Bridge, and the train ferry over the 16-mile Great Belt between Funen and Zealand, described in this issue. This route is circuitous, and with the post-war increase in traffic it has become congested. Since last summer the Grossenbrode route has helped to relieve it. At present, although wagons are conveyed, passengers must tranship, but this drawback may be largely offset when the Germans have completed improvements to the branch between Lubeck and Grossenbrode, permitting faster running. A shorter ferry route from the island of Fehmarn, lying off Grossenbrode, to the Danish island of Lolland, with a new railway thence to join the Gedser-Copenhagen line is proposed as a long-term project.

Continuous Rail Welding

A SECOND U.S.A. railway, the Northern Pacific, is experimenting with continuous rail welding on an extensive scale. A 10-mile stretch has been selected in the Montana highlands between Big Timber and Greycliff, some 4,000 ft. above sea level, where there are sudden and severe temperature variations from extremes of 100° F. in summer to -20° F. in winter. New rail of 115-lb. flat-bottom section in undrilled 39 ft. lengths was delivered to a temporary welding depot at Big Timber; the actual time required for each weld in the pressure butt-welding machine was 15 min., including the true alignment of the rail-ends: operations included a preliminary squaring of each end with a power hacksaw, and post-heating, normalising, and grinding of the running surfaces. The maximum continuous length welded has been 2,000 ft. of rail, and the long lengths have been run from the depot to the site on trains of 55 bogie flat wagons equipped with rollers. On site, the lengths of rail have been welded up continuously, the only breaks being the insulated joints required in connection with track-circuiting. The longest single rail in the 10-mile stretch is one of 6,903 ft.

Braked Coal Trains

THE first of a series of trial runs with vacuum-braked coal trains was made last Sunday in the Midland Division of the London Midland Region, when a 52-wagon coal train weighing 850 tons ran from Toton to Brent Yard at an average speed of 38 m.p.h., excluding one stop of 15 min., and a maximum speed of 60 m.p.h. Details are given elsewhere in this issue. This compares with an existing average speed for coal trains of 15 m.p.h. with a maximum speed of 30 m.p.h. between the same yards, and with average speeds of 20-25 m.p.h. for fitted freight trains in the same Division. A similar loaded coal train will leave Toton yard for Brent on alternate Sundays, the empties

returning on intervening Sundays. The Railway Executive has arranged for 100 standard 16-ton coal wagons to be fitted with vacuum brakes for the purposes of these experiments in the fast running of trains conveying up to 1,000 tons of coal. They are preliminary steps in an investigation into the possibility of fitting all freight vehicles with automatic brakes so as to attain higher running speeds. The subject was dealt with in a paper by Mr. S. E. Parkhouse, Chief Officer (Operating), the Railway Executive, discussed in our issue of November 2, 1951. As British Railways have 1,110,000 wagons, acceleration of freight trains may involve signalling and other alterations, and a change to automatic brakes would necessarily be a long-term policy.

Anti-Friction Bearings in Rolling Stock

THE fitting of railway rolling stock with anti-friction bearings has long passed the experimental stage and is now largely common practice in all parts of the world. Among the earliest application of roller bearings in British locomotives was the former L.M.S.R. 4-6-2 turbine-driven engine built at Crewe in 1935. The most recent application to steam locomotives on British Railways is the new standard engines, some of which are fully equipped with roller bearings, while others are so fitted on the tender axles. With regard to passenger stock, a composite carriage, the axles of which were fitted with roller bearings, was built at Swindon in 1929 by the former G.W.R. Considerable advance has been made in the design of anti-friction bearings in recent years, so much so that they now embrace vital parts of the locomotive, coupling and connecting rods, motion, reversing gear, and so on. The subject is dealt with in greater detail in an illustrated article elsewhere in this issue.

Meaning of "Permissive" in Signalling

REPLYING to a point raised at a recent meeting of the Institution of Railway Signal Engineers, Mr. A. N. McKillop aptly pointed out that when using the term "permissive" care should be taken to make clear first what was meant, because some confusion had arisen in that respect. In the so-called "absolute-permissive" signalling widely used in the U.S.A., which superseded the earlier "straight" or overlap controls for automatic signals on single lines, "permissive" does not mean that normally several trains are allowed at one time in a signalling section, after being duly warned, as would be implied when the term was used in this and some other countries. With the A.P.B. system the intermediate signals, dividing up the single-line section, are designated "permissive" as they may be passed at caution under the "stop and proceed" rule to meet possible cases of signal failure, whereas the signals controlling departure from crossing loops are "absolute" and may be so passed only by permission of the train dispatcher.

Locomotive Slipping at Speed

DURING the British locomotive exchange trials of 1948, a phenomenon noted in the dynamometer cars was the slipping of locomotive driving wheels when running at speed, particularly those of the "Merchant Navy" Pacifics of the Southern Region. This was in no case extensive, and was easily corrected. Investigations of diesel-electric performance on the New York Central System, U.S.A., disclosed a far worse tendency with this type of power, the more disconcerting in that the wheel slip relay indicators have proved unreliable. The latest type of indicator was found to record only 24 per cent. of the actual wheel slips. Special appliances installed on two twin-unit locomotives showed that on one run the leading pair of driving wheels of one unit had travelled 206 miles while the locomotive itself had been running 146 miles. On many runs records of slipping at wheel speeds up to 120 m.p.h. were recorded, and actual wheel speeds may well have been higher. Such speeds in any event often exceeded by more than 50 per cent. the rated maximum speed for the unit concerned, to avoid undue stress on the

equipment. Trials are now being made of slip recording appliances which it is hoped will prove more reliable in detecting both wheel slipping, the prevalence and extent of which has come as a surprise, and also wheel sliding due to locking by brakes or for other reasons.

Steel Supplies

THE Ministry of Supply allocations of steel for the first rationing period of 1952, the months of February and March, and the provisional allocations for the second and third quarters of the year, may seem hard to reconcile with the first Government statement last week that deliveries of steel would continue this year at about the same level as last. In fact, the allocations now made are based partly on the amounts of steel actually delivered to the various industries in the second quarter of 1950, when steel rationing was abolished, and partly on production in 1951 by individual steel users. There is likely to be a steel deficiency of some 1.5 million tons in 1952, that is, in relation to estimated needs. This deficiency is attributed to three factors: the reduced level of steel production, to which we referred in our issue of December 21; the increase in the requirements of the industries engaged in rearmament; and the needs of the export industries. The home market, it is stated, must bear the brunt, but basic home industries such as transport, coal, and power production, on which rearmament and export industries depend, will be given preference. The Government implies that in computing allocations, the greatest care has been taken to ensure that firms are given what is essential for production in the interests of the national economy.

The allocations made last week caused much concern in some industries. As they were based on factors obtaining in 1950 and 1951, and as production by users of steel generally increased last year, many firms found that allocations fell far short of their demands. Some firms—a small minority, and outside the railway supply industries—had put in excessive demands in the hope that their steel allocation, which they knew would be cut, would suffice after the cut had been made; others increased their demands over actual needs in the light of orders booked because they were not certain of the extent of their requirements in the near future in the light of further potential orders. The number of firms concerned with rearmament is very large, and after the needs of these and the basic home industries' needs have been met, the steel left even for major export industries is much reduced.

It is nevertheless hard to see why the locomotive industry, which is, and has been stated by the Ministry of Supply to be, of very great importance in the export trade, has suffered so heavily in the steel allocations for February and March. In general, locomotive builders' demands have been cut by 30 per cent. The Ministry of Supply states that allocations are based largely on a decrease of 10 per cent. on what would have been granted in the light of steel deliveries in 1950 and builders' production in 1951 had there been no steel shortage. In view of increases in orders in the past two years, the Government's method of assessment now has little relevance. The industry's requirements vary with the kind as well as with the monetary value of orders. What matters now is that enough steel is allotted to enable firms to fulfil orders and to honour delivery dates with their plant geared up to the planned rate of production for 1952, and without standing off skilled labour; the latter, given the attractiveness of lighter industrial employment, including rearmament work, might well be lost permanently to the locomotive industry. As it is, the 30 per cent. cut in locomotive builders' demands based on actual needs must result in four months' delay in production. The Locomotive Manufacturers' Association is representing the industry's case to the Ministry, and it is to be hoped that a larger modified allocation will result. In the case of the other major exporters of railway material, some carriage builders report heavy cuts in their demands, made presumably on the same basis as for locomotive builders. There are as yet no reports of heavy reductions in the allocations to the manufacturers of signal equipment and of rails, point and

crossing work, and so on, and the Ministry states that no cut has been made on the 1950-51 basis of computation. Manufacturers of wagons generally seem to have had their allocations raised 20 per cent. on the 1950-51 basis; that is not to say that in the light of increased orders their demands have been met fully, but their superior treatment compared with the locomotive builders is stated by the Ministry of Supply to be due to Government concern that production for railways in this country shall be sufficient for strategic and economic purposes.

The Government promise of priority to transport in this country as a basic industry implies that British Railways will be allowed as much steel as the Government thinks sufficient for them to function satisfactorily from the economic and strategic points of view. That seems to mean that they will continue to be patched, and denied the major improvements, most of them long since planned, which many senior officers wish to put in hand to keep the system in a sound condition. It is doubtful, however, if any deficiency in steel, if it comes about, will restrict improvements more than the existing shortage of manpower and the ban on capital investment.

Transport Reorganisation in France

THE French Government was defeated on Monday on a vote of confidence over economies on the nationalised railways contained in the Transport Reorganisation Bill. In our December 29, 1950, issue we gave a summary of the main provisions of this measure, which subsequently was held up by the political crisis in France and by the 1950 general election. As mentioned in our October 19, 1951, issue, Monsieur Antoine Pinay, Minister of Public Works & Transport both in December, 1950, and at the present time, again brought the Bill before the National Assembly. The Bill was divided into two main sections, the first proposing additional taxation on heavy road vehicles and the second including a reorganisation scheme for the S.N.C.F.

The Bill was referred to the Methods of Communication Committee of the National Assembly, which appointed Monsieur Bichet to report on it. In this report, details of which were made available in December, Monsieur Bichet, although approving the general lines of the Bill, was critical of some of its details. He was not in favour of the additional tax on all heavy road vehicles and proposed instead certain amendments of the taxes on petrol and fuel oil. He suggested revisions of the clauses regarding ministerial limits on the number of staff employed by the S.N.C.F., and modifying the retirement age.

In his budget estimates for 1952, Monsieur Pinay envisaged a subsidy to the S.N.C.F. of approximately fr. 80,000 million. In existing conditions, and bearing in mind the higher receipts expected from the recent increase in freight rates, it is estimated that the S.N.C.F. deficit for 1952 would have amounted to fr. 100,000 million. It appears therefore that Monsieur Pinay expected the S.N.C.F. to benefit to the extent of some fr. 20,000 million from the Transport Reorganisation Bill. At the end of December it was announced that the French Government had decided to delete from the Bill the clauses relative to increased taxation on heavy road vehicles. It was also stated that unless the law was approved by the end of February, 1952, certain of the clauses would be enacted by decree. Later, it was decided to make the issue one of confidence.

Two other proposed measures affecting the S.N.C.F. were tabled in the National Assembly. One was put forward by Monsieur Maurice Lemaire, a former Director-General of the S.N.C.F., who suggested structural changes in the S.N.C.F. leading to a decentralisation of authority and a closer liaison between responsible railway officers and the general public. He also envisaged a greater separation of the expenses due to passenger and freight operation, the purchase of more railcars, wagon-carrying trailers, containers, and so on, and greater co-ordination between road and rail transport. Both the proposals of Monsieur Lemaire and those of Monsieur Pellenc, who suggested possible ways of improving the return from secondary lines, will, of course, not now be considered.

Some Aspects of Bogie Design

BOogie design has tended to advance slowly for the reason that railway mechanical engineers must for obvious reasons avoid experiments as far as possible. Progress in other words has been by evolution rather than by revolution. Normal design has proved its practicability over a long period and most efforts have been directed towards improvements in detail rather than to the production of something fundamentally different. Arduous conditions have led to efforts to eliminate or reduce wear so that a vehicle can run longer between less expensive overhauls. These and other problems were covered by Mr. W. S. Graff-Baker, Chief Mechanical Engineer (Railways), London Transport Executive, in a paper to the Institution of Mechanical Engineers on January 4, dealing with some considerations of bogie design with special reference to electric railways. The author was unable to attend the meeting through illness, and his paper was read by Mr. A. W. Manser, Assistant Mechanical Engineer (Works), London Transport Executive.

Wear and tear on bogies is accentuated by the heavy duty inherent in electric traction, and Mr. Graff-Baker refers in this connection to London Transport services where a train is required to stop and re-start on an average every five-eighths of a mile, and where it had been necessary to push the acceleration to the economic maximum and braking to the physical practicable maximum. London Transport practice has been to line all wearing parts with manganese steel, which does not require any appreciable measure of lubrication. Wearing plates are welded to the axleboxes and horn guides and to the bolster rubbing surfaces provided to restrain the bolster from moving longitudinally in the bogie while permitting free vertical and lateral movement. Non-metallic liners are now being developed, and have been standardised in Italy, but these, while promising well, could not be attached by welding. The design of bolster swing-link hangers offered some difficulty in regard to wear, since space consideration generally precluded the provision of pins with generous wearing surfaces, and the lubrication of such pins presented difficulties as these bearings not only operated through small arcs under heavy loads, but also were subject to the deposition of grit and dirt. The use of rounded knife-edges for the hanger system working in grooved mating parts avoided the need for lubrication and reduced wear and tear. This practice has been adopted on British Railways and on the latest London Transport stock.

Some developments have been made in the United States towards eliminating all wearing surfaces. Use is made of radius bars connecting the moving part to the fixed part, with space between the parts, and movement is sufficiently rectilinear through the range required. Radius bars are of round section and are coupled through heavy rubber washers to the parts to be related. Similar tendencies are beginning to show themselves in Continental practice and in this country by the use of links with Silentbloc bushes. Regarding the design of wheels and axles Mr. Graff-Baker said that in Switzerland, operating under heavy braking conditions, wheels had been introduced with forged aluminium-alloy wheel centres with a view to reducing unsprung weight. The Reuleaux formula normally used to calculate axle diameter might not be correct in its usual form. Many axles running under tube cars with a low centre of gravity had not broken, although considerably overstressed according to the formula, and a corrected formula taking into account the height of the centre of gravity and making less improbable assumptions than the original formula, produced results similar to the original when used to determine axle sizes for normal railway rolling stock and also were in agreement with the observations on tube axles.

There was some, though not conclusive, evidence to show that motored axles tended to be more subject to crack development than trailing axles, even at lower calculated stress values. This was perhaps due to the increased impact of the wheel flange on the rail when the side movement of a heavy motor as well as of the wheel set and bogie were being arrested. There was also an indication that the

tendency to crack was less for axles of which the wheels were braked with non-metallic blocks, due perhaps to reduced flange wear and lower adhesion values. Experiments had been proceeding on the Continent with pneumatic rubber-tyre wheels for railway bogies. The economics of large numbers of rubber tyres, as compared with a few steel tyres, seemed to be unfavourable unless a supplementary fare could be charged, but a wider running rail now under consideration might change the position. Further experiments were being made on the Paris Metro with four-wheel pneumatic-tyre bogies running on a wide flat track.

The latest form of bogie on the District Line had a welded side frame with channel flanges and riveted cross-members. In these bogies brake rigging was dispensed with and individual brake cylinders used. Bolster springs were outside the frames for stability and they supported cross-bars from which the bolsters were hung by inside hangers. In these designs normal rubbing surfaces were provided to maintain correct relationship between moving parts. Future developments were likely to eliminate rubbing surfaces and metal springs by the use of rubber in shear. The trailer bogie on tube cars had always been a problem in design on account of the low car-floor height. Earlier designs had a frame suspended from springs over the axleboxes, with swing bolsters, except on the early Central Line cars, which had pressed-steel frames and sprung but not swung bolsters. Later designs followed the Central Line bogie, with the addition of a swing bolster, and the Central Line bogies were modified to this pattern; all have single brake-blocks. In 1937, it was decided to abandon the existing practice of having large motors on a few cars and to drive a larger proportion of the axles, using smaller motors, and a bogie was produced suitable for both motored and trailing positions, of low height and carrying only one motor. These bogies are all-welded and have side frames opened out at the centre to admit a long bolster with widely-spaced springs. Braking is by two blocks on each wheel with individual brake cylinder units.

Other aspects of bogie design dealt with in the paper included the design of axleboxes and the use of roller bearings. Mr. Graff-Baker maintains that for very heavy rates of braking and acceleration there is no doubt that the roller bearing axlebox is more reliable and in the long run less costly than the whitmetal-bearing axlebox. The roller bearing axlebox can take end thrust either through the same parts which carry the load or it can be provided with a separate thrust bearing. A simple form of rolling bearing axlebox of the cylindrical type is used on London Transport. This has a non-metallic end-thrust pad supported on the lid of the box and provided with shim adjustment. This form of box can be removed from the end of the axle without dismantling any part of the box or bearing. For electric railways, with the motive power embodied in the bogie, with a requirement for heavy and frequent braking, the problem of wear is important.

Loosening the Canadian Railway Fetters

IN the past 50 years, "spectacular improvement" has taken place in service and equipment on the railways of Canada and they can point to an impressive list of improvements and changes covering freight and passenger rolling stock, safety devices, roadbeds, and hundreds of operations which represent progress and response to changing conditions and requirements. It might well be that the railways had set the pace in the development of modern transport, according to Mr. Donald Gordon, Chairman & President of the Canadian National Railways, in a recent address to the Toronto Railway Club. The railways had been jockeyed into a position in which the newer forms of transport were permitted to operate in their specialised fields without having to accept the general obligations which are the historic legacy of the railways. For example, they were not obliged to follow the regulatory principles which bind the railways, nor were they obliged to provide all their own facilities. The railways should not be expected to meet all and every type of competition in the trans-

port field, an impossible task. There were some things that they could do better than anybody else and some things which others could do better. There were also situations in which the railway was the development force to open up the country, and in due course competition in transport would follow this development.

It ought now to be recognised that a regulatory mechanism devised in restraint of monopoly had now, with the advent of powerful competition in transport, become transformed into restraint of competition. The railways did not fear competition provided the rules of the game were fair and just. Mr. Gordon advocated that regulatory controls should themselves recognise a changing world and that they should be modified, amended and adapted to keep up to date with changing techniques, changing methods and changing conditions. Only in that way would the public receive the full benefit of technological changes and be assured that its total transport cost was held to the minimum consistent with the quality of service demanded.

While the present rigidity of regulatory control continued to be imposed on the Canadian railways, Mr. Gordon had little real hope of simplifying their freight rate structure. The present freight rate tariff was a structure of "unbelievable complexity." He was not prepared to say that they could ever achieve a freight rate structure in Canada to satisfy everyone, but claimed that an equalising of competitive conditions would bring that possibility far closer to reality as well as giving the railways a chance to develop along lines best suited to their great responsibilities and great capacities. If the Canadian railways were to give the public the full benefit of co-ordinated techniques, an expansion of their service to include road competition was inevitable. It was interesting to observe that it is now the road haulier who "views with alarm."

Freight Movement on British Railways

(By a Correspondent)

BEGINNING on June 1, a series of articles has discussed the state of freight movement on British Railways, as shown by the periodical issues of the British Transport Commission *Transport Statistics*. These four-weekly surveys were made because the railways were recovering slowly from operating difficulties, which were due originally to bad weather towards the end of 1950. The statistical analysis showed that, by March, the railways on the eastern side of the country were working freely, whereas mobility remained poor in the London Midland and Western Regions throughout the year. On November 4, the position in these Regions was nearly as serious as it was in March. The article published in our issue of January 4 gave details of a disquieting setback in freight-train speed and promised a reply to the comments of a "Railway Operating Officer" on the L.M.R. freight traffic working, which were published in the December 14 issue of *The Railway Gazette*. The points put forward in explanation of these operating results are dealt with in order below.

(1) *Great density of traffic, entailing much short-distance working.*

Measured by net ton-miles per route mile, traffic is roughly twice as dense in the London Midland as in the Western and $1\frac{1}{2}$ times as dense as in the Eastern Region. Additional tracks, however, have been provided so liberally in the L.M.R. that the ratio of track mileage to route mileage is 213 per cent. In the Western Region, with its long stretches of single line, the ratio is 172 per cent., and in the Eastern 191 per cent. On a track-mile basis, the London Midland density is about 1.6 of the Western Region figure and only a tenth greater than the Eastern.

Short-distance working is not peculiar to the L.M.R., and it is well equipped with sidings to lessen the occupation of running lines. Its mileage of "sidings expressed as single track" is 101 per cent. of route mileage, compared with 71 per cent. in the Western Region and 85 per cent. in the Eastern. The London Midland planners of freight movement have "ample room and verge enough" for originating tonnage today is far below the forwardings in

many pre-war years. Some forget that in 1913 the old railway companies dealt with 68 million tons of merchandise, 71 million tons of minerals and 225 million tons of coal, a total of 364 million tons. Ten years later, at the time of railway amalgamation, the new companies forwarded 343 million tons, including 222 million tons of coal, the equivalent of the country's total output in 1951.

(2) *Freight train-miles are approximately one-third of the British Railways total and this affects speed of working on account of the heavy slow-moving traffic.*

During the 44 weeks to November 4, freight train-miles were 31.8 per cent. of the total for all Regions. In 1948, the percentage was exactly 33.3, but has declined in each succeeding year. During the 44 weeks to November 4, 1951, the L.M.R. worked 949,000 fewer freight train-miles (2.4 per cent.) than in 1950, while the Western Region worked 262,000 more miles (1.2 per cent.) and the Eastern 148,000 more (0.7 per cent.). For these 44 weeks, "freight train-miles per mile of track per day" were 13.7 for the London Midland, 9.4 for the Western and 13.2 for the Eastern Region. Judged by this unit, the London Midland was not much harder pressed than the Eastern and obtained more relief through the reduction of coaching steam train-miles by 1,980,000 (4.1 per cent.), compared with a cut of 812,000 (2.6 per cent.) in the Eastern Region.

(3) *The freight train load exceeds that of any other Region.*

The article in our issue of June 1 drew attention to the growth of the L.M.R. train load to a peak of 187 tons in the March period as a possible reason for slow movement. In the four weeks to November 4, the train load reached a new record of 188 tons, an increase of 12 tons on 1950 (7 per cent.). It is significant that at the same time freight train speed declined by nearly a quarter of a mile an hour to the low figure of 6.71 m.p.h.

The size of the train load is influenced by the decrease in merchandise in the London Midland Region and the increases in minerals and coal. "Railway Operating Officer" lays stress on the average wagon load of minerals being over 12 tons, but since 1947, loading of both minerals and coal has improved over the whole system as larger wagons have been put into service. In 1950, nearly 27,000 mineral wagons under 14 tons capacity fell out, while 12,780 of 14-17 tons capacity and 6,300 carrying 20 tons or more were brought into service. The stock of large wagons will have been increased further in 1951, for in the November period British Railways had an average wagon load of 11.42 tons of minerals, compared with the L.M.R. load of 12.36 tons, and a coal wagon load of 11.49 tons, more than half a ton above the London Midland's average of 10.82 tons. Apart from supplying larger wagons, no Region can do a great deal to improve the loading of minerals and coal, but the loading of merchandise can be controlled more effectively and it is surprising that the London Midland Region could not raise its load in November to the all-line average of 4 tons.

(4) *It is not practicable to compare one Region with another, on account of varying circumstances. Any comparison should be with previous results in the same Region, but that is influenced by diversions of traffic from one Region to another and changes in flow of traffic, particularly coal.*

On occasion the series of articles compared the London Midland operating results with its own past performance, with other Regional statistics and with the all-line figures of British Railways. In such comparisons the trend of development matters most of all and throughout 1951 went the wrong way in the L.M.R. The statistics, being based on the work done by each Region, give credit for diverted traffic and reflect the impact of changing streams of traffic. Such fluctuations affect all Regions from time to time, and hit the Western, more particularly in South Wales, hard during the last twelve months.

The London Midland Region has a large and increasing volume of traffic connected with a greater variety of industries than is to be found in any other part of the country. It is an axiom that ton-mile statistics usually will show to better advantage in periods of high traffic volume. The reverse is the case in the London Midland Region.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

A Fresh Outlook Needed

December 30

SIR,—Allow me, pray, to thank you for and congratulate you on your most interesting article on railway centenaries of 1952 in your issue of December 28. I only wish that the writer of this letter, who is a grandson of one of the railway contractors mentioned in the article, had either the scope (or the ability!) to be able to infuse a little new life into the apparently dying body of our British Railways, many sections of which his grandfather built.

Surely all that is wanted is a fresh outlook and a bit of imagination, and the courage to try whether cheaper fares, greater facilities to the public, and a cessation of these seemingly endless amputations to the limbs of the poor railway body, will not change the whole position in 1952?

Yours faithfully,

MICHAEL PETO

Dundonnell House, By Garve, Ross-shire

St. Pancras Hotel

December 28

SIR,—With reference to Mr. Kenneth Brown's letter published in your December 28 issue the following advertisement appears in *Herapath's Railway Journal* of Saturday, May 3, 1873:—

"The Midland Grand Hotel, St. Pancras Station, London, will be open for visitors from Monday, May 5, 1873. Two hundred and fifty public and private sitting and bedrooms, varying in charges from 2s. 6d. to 20s. per day, are now ready. Perfectly dry and complete with every comfort.—ROBERT ETZENSBERGER, Manager."

Evidently F. S. Williams did not revise the various editions of his book very thoroughly as his statement, to which Mr. Brown refers, also appears word for word in the fourth edition published in the latter half of 1878.

Yours faithfully,

V. STEWART HARAN

40, Edenfield Gardens, Worcester Park

Lighting of Railway Sidings

January 6

SIR—I read with interest your recent article on "Lighting Schemes for Railway Sidings," in your December 28, 1951, issue, particularly as I was the originator of the experiment in high elevation lighting carried out by the Southern Railway at Hither Green in 1947 and referred to in the article.

In commenting on the more recent installation of high tower lighting at the Abbey Works of the Steel Company of Wales, you state that "it was necessary to have towers of this height to prevent shadows being cast across the tracks by tall buildings near the sidings." I hardly think this can be correct—certainly not in the case of the towers shown in your illustration which are in the middle of a group of sidings. Moreover I know that the decision to adopt high tower lighting was based on the experience gained at Hither Green, and I think it is important to bear in mind that this method of lighting large areas has an effect in *seeing power* inherently different from that obtained by the usual batteries of flood-lights on towers from 50 ft. to 90 ft. which have been installed on the Continent and in the U.S.A.

Most of the schemes hitherto installed have lost a good deal of their value because of the discomfort glare coming from the projectors in the line of sight, and it is only when the light comes from well overhead that the comfortable seeing is realised, which is such an unusual feature in the installation at Abbey Works.

It is interesting to compare illustrations that have appeared recently in *The Railway Gazette*, namely those of Toton Yard on pages 686 and 688 of your December

21 issue, where a large number of light sources is directly in the field of view and that on page 718 of your December 28 issue in which the whole area of the sidings can be traced without any distraction. Of course, I am aware that when viewing from the control towers, the reflectors on the fittings at Toton ensure that no direct light reaches the eyes, but what about the men who have to move about in the yard?

Yours faithfully,

ARTHUR CUNNINGTON

Yaffle Cottage, Marehill, Pulborough

Control of Capital Investment

January 2

SIR,—Your Correspondent makes the bald statement in your December 28, 1951 issue, that "What cannot be justified is expenditure such as the Railway Executive is incurring at Hampstead Heath and Gospel Oak stations, two sleepy hollows on the moribund North London line."

He makes no reference to the fact that both these stations sustained war damage, Gospel Oak so much so that only the shells of the platform buildings remain. The traffic at both these so-called "sleepy hollows" is quite considerable, the originating passenger journeys in 1950 (excluding season ticket holders) being 292,000 at Gospel Oak and 381,700 at Hampstead Heath. Inwards traffic at Gospel Oak arises from a swimming pool nearby and at Hampstead Heath it is much greater, especially during the summer months, some 100,000 passing through the station at August Bank Holiday weekends.

As to the "moribund" North London line itself, as "Your Correspondent" calls it, one wonders whether he has travelled over it at all during recent years. Apart from the electric passenger service, he makes no reference to the constant stream of steam-operated freight trains which traverse the line each way throughout the day, except at peak business travel periods, evidence of the vital importance of this freight traffic link between several main trunk routes which converge on London.

Yours faithfully,

GEORGE DOW
Public Relations &
Publicity Officer

London Midland Region, Euston House, N.W.1

Third Class Seats in Corridor Trains

December 31

SIR,—In your December 21, 1951, issue you state that passengers reserving seats in Manchester to London trains are being given notices asking them to lift the armrests to make room for a fourth passenger if the train becomes crowded. This is not peculiar to Manchester as it is also proposed at other reservation stations. Such an instruction has been in existence also on the London Midland Region and the L.M.S.R. for almost as long as the third class corridor compartments have been provided with armrests.

The response from the travelling public has always been very reluctant as it not unnaturally concludes that the provision of two armrests implies there is seating accommodation for only three passengers, and as it is almost invariably necessary for the staff to have to insist on the armrests being lifted before a movement is made, the result is three thoroughly disgruntled clients for every passenger for whom a seat is provided. Such passengers will be a bad advertisement for us for a long time afterwards, as they will be quite a while before they forget their "grievance." If this is the case with unreserved seats, how much more irritating will it be in the case of passengers who have gone to the trouble and expense of booking seats?

Who will request the passengers to raise the armrests? The time allowed at stations is sufficient only to enable normal station duties to be performed, so little can be

done at intermediate stopping places. Train ticket collectors can do something, but many trains have no such staff on them, and on others they only travel short stretches. The men in this grade therefore will cover only some, or a portion of some of the journeys.

If the Railway Executive desires that four passengers a side should be accommodated in each corridor compartment, I submit this will be achieved only by the removal of the armrests and the numbering of each seat. This would avoid arguments arising and the distribution of exhortations in pamphlet form, and also simplify the work of reservations staff.

Yours faithfully,
SUPERVISOR

97, Palmerston Street, Derby

The Frölich Rail Brake

December 31, 1951

SIR,—In five articles on the modernising of Toton Marshalling Yard, you have described how another step forward has been taken in mechanising wagon shunting on British Railways. The use of wagon retarders has been for a long time common practice in America, but it was from Germany that our railway companies first heard about the advantages of rail brakes, in suitable operating conditions. The story is worth telling to show how railway history is made.

After the 1918 armistice Mr. Oscar Lindberg, a junior officer of the North Eastern Railway, was attached to the Army of Occupation in Germany and kept an observant eye on transport in his spare time. One of several reports, which he sent home, related to the Frölich rail brake. The report reached York after the London & North Eastern Railway was formed and was treated simply as an item of interest information.

The subject was forgotten until 1927 when Mr. C. E. R. Sherrington, then Secretary, Railway Research Service, circulated a memorandum, based on official figures, about the working of the Frölich rail brake system at yards like Hamm. The L.N.E.R. Company was ready at that time to proceed with a scheme for extending Whitemoor Up Yard, March, on orthodox lines, but after a thorough enquiry, conducted with the helpful co-operation of Dr. Dorpmüller, decided to revise the plans completely to provide for the installation of rail brakes.

Nothing, said Napier of Merchiston, is perfect at birth. Like his system of logarithms, the Frölich rail brakes brought into use at Whitemoor in March, 1929, needed some adjustments, but before long Mr. H. H. Mauldin, Superintendent, Eastern Section, was able to read an informative paper to the Institute of Transport on the success of the mechanised yard. The principles of the March layout were followed in the new Inward Yard, Hull, opened in December, 1935. Within a month or two Mr. J. S. Harper, District Superintendent, Hull, could say that the working of the mechanised yard was as fascinating to watch as it was effective.

It thus stands to the credit of the Railway Research Service that one of the many useful reports, issued from its Westminster office between the two world wars, started the process of mechanising marshalling yards in this country. Everyone interested in railway working must hope for the success of the latest developments at Toton. In the present time of high wages and limited manpower, the chief means of reducing railway operating expenses is the resort to mechanical devices whenever there is an assured return on the expenditure involved.

Yours faithfully,
R. BELL

Frognaal, N.W.3

Gold Coast Locomotives

December 28

SIR,—In your December 21, 1951, issue, on page 689 you have a description of recently-built locomotives for the Gold Coast. At the beginning of the sixth paragraph you state that the coupled wheels are of cast steel SCOA-P design. In fact, all wheels on both locomotives and tender are of SCOA-P design and we take leave to draw your attention to this small error.

As sole manufacturers of SCOA-P wheel centres in Great Britain we are, perhaps naturally, anxious that the whole, rather than a part, of the results of our endeavours is placed on record. The published photograph, of course, largely confirms our statement.

Yours faithfully,
W. H. MORTON,
General Sales Manager

K & L Steelfounders & Engineers Limited, Letchworth

Publications Received

Verzaubertes Kursbuch (Enchanted Timetable). Hamburg 13, Hoffmann & Campe Verlag. Harvestehuder Weg 41. 96 pp. Illustrated. Price D.M. 2.80.—This special railway issue of the travel magazine *Merian*, contains a variety of articles, essays, and short stories on railway subjects. The photographic illustrations, both in line and half-tone, are well chosen and reproduced.

Nationalised Transport Operations in Great Britain: Third Year.—This review (No. 83) is the third of a series of studies by the Bureau of Railway Economics, Association of American Railroads, analysing transport operations in this country since the nationalisation of the railways. The first study (No. 79) covered developments leading to nationalisation, showing how it was brought about, while the second (No. 81) dealt with changes in the transport organisation and operations in 1949. The third annual report of the

British Transport Commission for the year ended December 31, 1950, supplies most of the information on which the present booklet is based.

Calendars for 1952.—We acknowledge the receipt of calendars for 1952 from the South African Railways, the *Railway Review*, *The Irish Times*, Saunders-Roe (Anglesey) Limited, and the Pyrene Co. Ltd.

Dust Collecting Units.—A third edition of an illustrated booklet (No. T.1) dealing with Tornado dust collecting units has been issued by Keith Blackman Limited which covers in 24 pages the present range of five units. This new publication (No. 16) is twice the size of previous editions and includes typical arrangements of Tornado equipment as well as dimensional drawings and performance data.

Forging Hammers.—Details of their new "DG" air-operated forging hammer are given in a leaflet (DS/2001/51) issued by Hofman Bros. Ltd. The machine operates at pressures between

70-90 lb. per sq. in., and is intended for the manufacture of picks, moil points, chisels, and similar light forgings. A pair of combined swaging and shearing blocks can be supplied in which the shearing blades can be removed for redressing and can be placed in alternative positions to suit the work being done. These blocks enable material to be forged and cut to length without using a cutting-off machine. The hammer is operated by foot lever.

French Railways Tourist Literature.—Travel publications distributed recently by French Railways Limited, 179, Piccadilly, London, W.1., are a booklet entitled "France" and a folder, "Holiday in France," both stressing the scenic and cultural diversity of the country and the strong individuality of each province. There is also a series of folders on the main tourist regions, including the Riviera, Corsica, Normandy and Brittany, and the Basque Country. All are attractively designed and contain maps and useful travel information.

THE SCRAP HEAP

All-Night Ride Under Train

A Bulgarian refugee apparently travelled from Paris to London lying on the rods under a sleeping car of the "Night Ferry" service. He was not noticed when the "Night Ferry" left Paris at 9.45 p.m. nor when the sleeping cars and van were shunted aboard the ferryboat at Dunkirk. During the journey to Victoria, the train travelled at 70 m.p.h. When the "Night Ferry" stopped at Platform 2 at Victoria at 9.10 a.m. he jumped on to the platform.—From "The Daily Telegraph."

Squeeze

One's friendliest railway train is a purely personal choice. For years mine was the one between Manchester and London, either way, any time. There were always friends on board. And now the friendliest train is ripped and torn by controversy—all because the Railway Executive has made a request to passengers to raise the armrests to give an extra seat a side in the compartment.

Some irate passengers who have paid a shilling for a reserved seat have told the authorities: "If we share our seats

we want all or part of our shilling back according to how tightly we have to squeeze."

Imagine Solomon, the Rebate Inspector, traipsing along the full length of the "Mancunian" with his tape measure, handing out slips announcing his judgments—penny for a small child, tuppence for a schoolboy, up to a shilling for the portly types.

The inspector will at last have time for his job. The Manchester-London train now takes 3 hr. 50 min.—35 min. longer than in 1939.—Trevor Evans in the "Daily Express."

Gill Sands

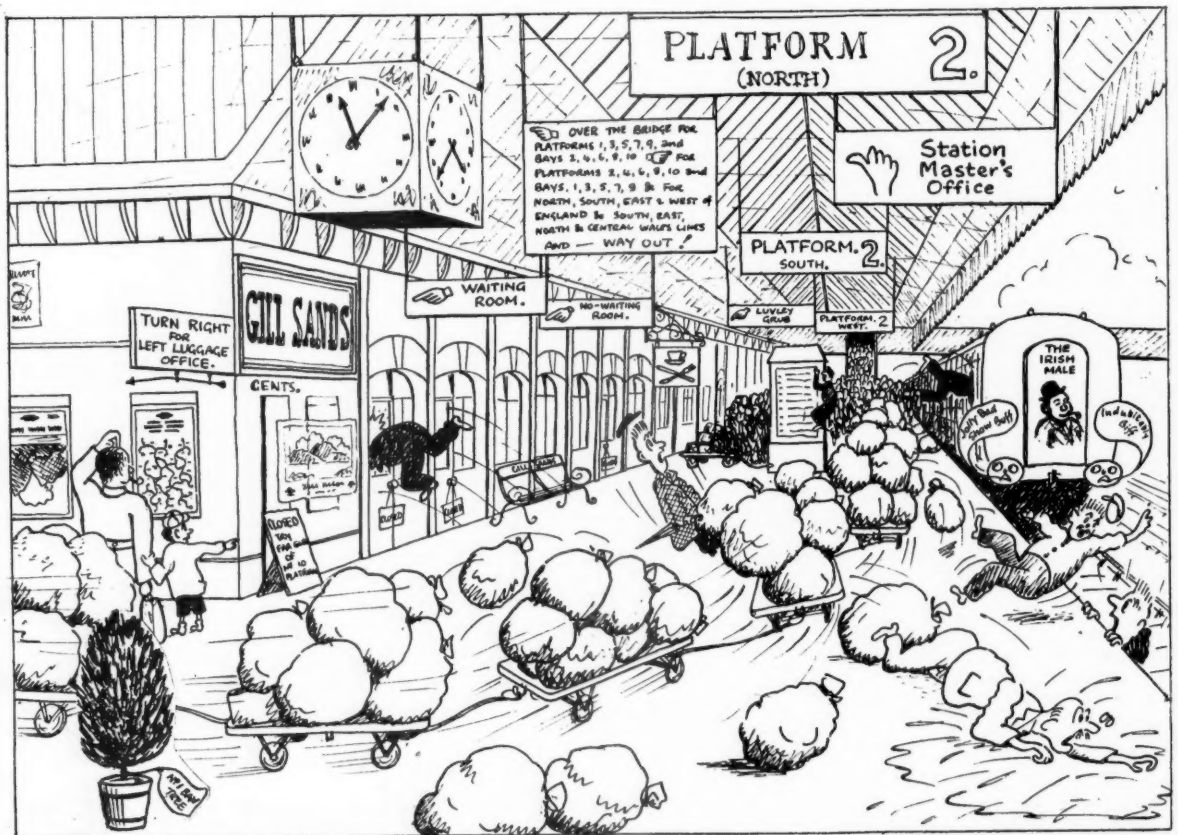
The sketch reproduced below, depicting "Gill Sands Station," has been sent to us by Mr. George Dow, Public Relations & Publicity Officer, London Midland Region. The original design formed part of a Christmas card which was sent to Mr. Dow by the members of his staff. It is really a cartoon version of the official Christmas card sent out by the London Midland Region and amusingly burlesques Mr. Dow's well-known activities in such fields as station nameboards, signs, and advertisements.

Irish Railway Coat-of-Arms

The accompanying illustration shows the coat-of-arms in its later form of the now-closed Dundalk, Newry & Greenore Railway (see article on page 50). Britannia (left) is clasping the hand of a female figure symbolising Ireland, at whose feet sits a retriever.



In the background, but not visible in the representation, is a locomotive of modern design and bogie coach; earlier transfers showed a single-driver locomotive and four- or six-wheel coach.



Illustrations by courtesy]

[Director, Colney Hatch

GILL SANDS STATION

Designed 1951, de-signed 1952 (we hope!)

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

RHODESIA

Railway Memorial in Cathedral

One of three cloisters being built at Salisbury Cathedral (Rhodesia) will include a bay which will be a memorial to railwaymen who fell in the war. It has been jointly subscribed for by the Rhodesia Railways and the Rhodesia Railway Workers' Union.

Traffic Increase

The following published statistics indicate the increase in traffic over the lines north of Bulawayo during the past five years: gross ton-miles (percentage increase over October, 1947), 9.57 in October, 1948, 25.41 in 1949, 47.72 in 1950, 65.38 in 1951; net ton-miles— increase over October, 1947, 13.23 in October, 1948, 25.81 in 1949, 50.03 in 1950, and 68.39 in 1951.

Financial Results

Revenue for the five months ended August 31, 1951, for all sections totalled £5,614,052, less expenditure £4,626,909, leaving a surplus of £987,143, or £17,498 more than in the preceding twelve months.

VICTORIA

Petrol Railcars Converted to Diesel

The first of the 10 petrol-electric rail motors has been fitted with an American 265-h.p. diesel engine and is now in service on the Geelong line.

The petrol-electric vehicles were nearing 750,000 miles when the conversion programme was decided on. They were used mainly on branches, where they gained a reputation for speed and dependability.

INDIA

Meeting Famine Threat

At the beginning of last year famine threatened the State of Bihar, but rapid measures prevented it from reaching menacing proportions. The East Indian Railway made great efforts to speed up the despatch of foodgrains to the affected areas of Bihar. Special trains in block rakes, planned by the railway in consultation with the Ministry of Food, the Government of India, and the Port Commissioners, Calcutta, were run on fast timings in co-ordination with the other railways concerned.

Between March and September, nearly 300 specials carrying about 370,000 tons of foodgrains were despatched by the East Indian Railway from Calcutta Docks to places in Bihar. Besides, 26,750 tons of grains from the Uttar Pradesh, Madhya Pradesh and the Punjab were also moved by special and ordinary trains.

In conveying foodgrain to North Bihar the main handicap was transshipment as the East Indian Railway in Bihar runs parallel to the south bank of the Ganga and the Oudh Tirhut

Railway serves the north bank. Thus the foodgrain for North Bihar had to be carried across the river by ferry service at transshipment points. A new transshipment yard at Banaras (Mandua dihi) was constructed at a cost of Rs. 14 lakhs and opened on June 1. It was at first capable of transshipping 30 broad-gauge wagons a day, but can now handle 72 broad-gauge wagons a day (56 goods wagons and 16 coal wagons).

CYPRUS

Railway Closed

The Government Railway was closed on December 31 and its services were replaced by road transport. It was 71 miles long, laid to the 2 ft. 6 in. gauge, and opened in 1905. Losses have been on an average more than £4,000 a year. Traffic has steadily declined; in July, 1949, the line carried 8,360 tons of goods, but in July, 1951, only 2,587, of which more than half was Government traffic.

The closing of the railway was foreshadowed a year ago, when the Government announced that the time had come to replace the track and rolling stock if the line were to continue operation. After consideration the Government decided that the cost involved, £400,000, could not be justified, particularly as it would reduce funds available for more urgent projects.

There is not expected to be any difficulty in handling the traffic by road. The import of diesel-engined lorries is now allowed, and the layout of Famagusta Harbour is to be altered to enable road vehicles to serve it more easily.

ARGENTINA

Mar del Plata Services

The off-season Buenos Aires-Mar del Plata service (one slow day train and four weekly expresses in each direction) is being gradually increased to three daily expresses in each direction. Since December 15 one of the two six-coach air-conditioned sets recently acquired from the U.S.A. has been working on this service to a 4 hr. 55 min. schedule. The fare for travelling in this stock is \$150 single, compared with \$71.10 for the Ganz diesel express and \$65.90 (plus \$50 extra for Pullman seat or \$35 extra for semi-Pullman) for the other expresses, which take 6 hr. 20 min.

Combined River-Rail Transport

The General Urquiza Railway has withdrawn the sleeping car services between Federico Lacroze (Buenos Aires) and the provinces of Entre Ríos and Corrientes. In their place, a new service combined with the nationalised *Compañía de Navegación Fluvial* has been inaugurated. Passengers now embark by river steamer at the South Basin, Buenos Aires, and travel to Concepción del Uruguay, where they transfer

to the General Urquiza Railway for Posadas, Corrientes, Curuzú-Cuatiá, and intermediate stations. The ferry between Zárate and Ibicuy is now used by goods trains only.

MEXICO

Mexico-Oaxaca Line

The new standard gauge line between Mexico City and Oaxaca is due to be inaugurated this month. It will facilitate the rapid movement of produce from the agricultural areas of the south-east and shipments of raw materials and finished products from manufacturing centres in the centre.

The 438-mile section between Puebla and Oaxaca, previously connected only by narrow-gauge line, has been relaid to the standard gauge. Most of the line is now laid with 112 lb. rail, with 80 lb. and 90-lb. rail on some sections.

Southern Pacific Purchase

The Government, through the National Railways, has agreed to purchase the Southern Pacific of Mexico for the sum of \$12,000,000, of which \$3,000,000 in cash will be paid when the contract is signed and the remainder over a 15-year period. To finance the deal a bond issue has been approved.

SWITZERLAND

Zurich-Sargans Line Doubling

The doubling of the Zurich-Sargans-Buchs main line is proceeding rapidly. The Reichenburg-Ziegelbrücke and Unterterzen-Flums sections were doubled in 1950. The second track has been completed on the 1½-mile Schübelbach-Buttikon-Reichenburg section, on which double-track working began on December 18. In the 36 miles between Zurich and Ziegelbrücke, only 4½ miles are still single, between Lachen (25 miles from Zurich) and Schübelbach-Buttikon. This section is to be doubled within the next two years.

FRANCE

Suggestion Scheme

A recent report shows the importance attached by the S.N.C.F. to its suggestion scheme. In 1950, 873 suggestions were received from the staff, compared with 851 in 1949 and 1,072 in 1948, the record year. Of the 1950 total, 341 suggestions qualified for prizes. Suggestions qualifying for prizes were greatest in the mechanical engineering department.

Examples of successful suggestions during 1950 include an appliance to facilitate the inspection of couplings between the engine and the tender, an appliance making it possible to use a hydraulic press for shaping the body plates of open bogie (TTY) wagons, a device for detecting telephone faults, and a method of drawing timetable graphs.

Improved Facilities at Bricklayers Arms, Southern Region

*Additional accommodation
for Continental goods traffic*



Interior of "E" Shed showing new concrete floor and end framing fitted with hinged doors

ALTERATIONS recently carried out to "G" Shed at Bricklayers Arms Depot, Southern Region, have greatly facilitated the clearance of general merchandise from the Continent, in particular that received by the Dover-Dunkirk train ferry service.

In 1949 it became apparent that the accommodation at the depot was inadequate for handling the traffic, as at that time only half of "G" Shed was bonded and in the warehouse itself there was only a small customs lock-up on the top floor. It was decided therefore to re-organise the depot and to apply to the customs authorities for the complete bonding of "G" Shed and warehouse.

This has meant that local traffic pre-

viously handled and stored in "G" Shed and Warehouse has had to be removed elsewhere; accommodation for most of it has been found by converting "E" Shed (which was used for "cleared" Continental traffic) into a single-storey warehouse, and transferring traffic via the Newhaven route to Blackfriars. Under the old arrangement outwards traffic was loaded in ferry vans at Bricklayers Arms and examined by the customs on arrival at Dover, but the revised procedure enables the traffic to be conveyed from Bricklayers Arms to destinations throughout Western Europe without further examination.

The south side of the warehouse, originally open for the loading of vehicles, was closed with a 9-in. brick

wall, 9 ft. high, surmounted with a wire mesh screen to admit light and provided with seven pairs of sliding doors. A large hinged door was also fitted across No. 6 siding at its entrance to the building; it is protected from accidental damage, when closed, by two sets of hinged timber buffer beams placed about 25 ft. clear of the door. The partition separating "G" Shed from "G" Warehouse and consisting of galvanised corrugated sheeting and wire mesh screens on steel framing, was removed. This, incidentally, improved natural lighting and provided much-needed material for re-use.

Fluorescent Lighting

To facilitate Customs examination, fluorescent lighting is being provided over the examination benches on all floors of "G" Warehouse.

"E" Shed, open at both ends, is a steel-framed structure, containing two island loading platforms, separated by a 34-ft. cart road and served by four sidings; the two sidings in the cart road are set in flush with the stone paving. To increase the storage capacity, the whole of the road surface including the sidings was re-surfaced with 6-in. thickness of plain concrete throughout its length. The east end was closed with galvanised corrugated sheeting on steel framing and provided with a pair of hinged doors opening outwards.

To prevent rain entering through the roof ventilators, the sides were closed with strips of corrugated asbestos sheeting cut in half longitudinally and supported on second-hand boiler tubes welded to existing tee brackets. Lastly, the whole of the roofing was carefully examined and repaired and a contract was let for waterproofing.

NORTH EASTERN REGION STATION CLOSED.—The North Eastern Region of British Railways closed Hampole Station on the Doncaster-Wakefield line after the running of the last train on January 5. An alternative bus service for passengers is operated by the Yorkshire Traction Co. Ltd. Parcels and sundries goods traffic is being accepted at South Elmsall Station and a collection and delivery service for this traffic is performed by British Railways motors operating from a railhead. Full wagon load traffic is being dealt with at Carcroft or South Elmsall.

DIVERSION OF "SIMPLON ORIENT EXPRESS."—Whilst the Simplon line was closed recently by a landslide, the main portion of the "Simplon Orient Express," conveying through vehicles between Calais or Paris and Trieste, Belgrade, Sofia, or Athens, was diverted via Modane, the Mont Cenis Tunnel, and Turin, as recorded in our issue of December 7; the normal route was followed east of Milan. The five or six vehicles diverted were attached in both directions to the "Rome Express" between Paris and Modane. Eastbound, they were

worked in a *rapido* from Turin to Milan; the normal S.O.E. schedule was picked up at Milan. Westbound, they were worked specially from Trieste to Turin; 200 min. was allowed for the 166 miles from Venice to Milan, with a stop at Verona.

SAVINGS BY WESTERN REGION SWINDON STAFF.—Some 35 of the British Railways (Western Region), Swindon, National Savings Groups, each year arrange a target, which for 1951 was £34,000. By November this figure had been passed and at the annual meeting Mr. H. R. Webb, who presided, said that savings for the year already amounted to £39,123. Mr. Webb also reported that the target for 1952 had been set at £37,500. He added that 24 groups had already passed their individual targets and that it was expected that six more would do so before the end of the year. He paid tribute to two group secretaries who were retiring in January, Mr. B. C. Woodbridge, Secretary of No. 9 Shop Carriage & Wagon Works Group, and Mr. L. Lambert, Secretary of No. 18 Shop Carriage & Wagon Works Group. The meeting was also addressed by Mr. E. C. H.

Jones, Secretary of the National Savings Committee. He presented the challenge cup to Mr. E. W. Hancock, Secretary of the Locomotive Department Spring Shop Group which exceeded its target ten times. The runner-up in this respect was the Locomotive A.V. shop with nearly three times its target.

BRITISH INDUSTRIAL PLASTICS LIMITED.—The directors of British Industrial Plastics Limited report a group profit of £557,451 for the year to September 30, 1951, which is an increase of £163,212 on the amount for the previous year. After depreciation, taxation and other charges, the net profit is £159,957, against £111,201. The final dividend on the increased ordinary capital of £830,892 is 10 per cent., making, with the 10 per cent. interim on £580,892, a total of 20 per cent. This is the same total as paid on the smaller capital for the previous year and made up of 8 per cent. interim and 12 per cent. final. A bonus of ½d. per 2s. share, of 2½ per cent., tax free, is also recommended out of a capital profit derived from the sale of part of an investment.

Ball and Roller Bearings in Modern Rolling Stock

A comparison between the use of anti-friction bearings and plain bearings

By Geo. W. McArd, A.M.I.Mech.E.

DURING the last two decades considerable success has attended the equipping of rail units with anti-friction bearings, with the result that an increasing number of specifications calls for ball or roller bearings to be fitted at all vital points for locomotives and coaches. Where the chief gain was formerly assumed to be the reduced friction in such a bearing—and therefore a lower hauling power could be used—today this is but one of many claims that have been substantiated in service.

It is worth remembering, however, that a machine which is easily set in motion will require a greater braking force to bring it to rest, as the normal brake power provided relies on the extra frictional resistance afforded by the plain bearing. In the driving gear of the engine, ball and roller bearings

In the construction of locomotives and rolling stock generally, the following gives a fair idea of the extent to which this type of bearing has been used:—

Locomotives: Axleboxes (bogie driving, truck, and tender); crosshead gudgeon; coupling and connecting rods; valve gear; bogie pivots; spring compensating beams.

Rolling stock: Axleboxes; bogie pivots.

Diesel-engine vehicles: Axleboxes; gearboxes; engine bearings; generator, armature bearings; motor armature bearings.

Locomotives

Perhaps the most important sphere in which the ball or roller bearing can assist is in the main axle carrying bearings, the loading of which varies considerably. The ordinary function of these journals is to support the engine's mass, but in axles which are subject to braking, a second force is introduced. On all coupled axles, and on trucks which are fitted with a booster engine, a further force has to be resisted, *i.e.*, that of driving.

Fig. 1 shows diagrammatically the loading of a coupled axle, the load A on each journal being that due to the mass acting through the springs; the driving force B due to the steam load in the cylinder, reaching 40 tons and even more on main-line engines in this country. A third force C is that due to braking, and may exceed A on the ultra-high speed engines.

A roller-bearing axlebox, or one with a combination of rollers and balls, has definite advantages over the plain bearing type in regard to its lubrication, and the exclusion of dirt and grit which is possible on the former type by very efficient seals and labyrinths. When mounted on the axle, the required quantity of lubricant is added and the box is closed, topping-up of the oil or grease being done at very wide intervals of time when in service.

Tests carried out on the turbine locomotive introduced by the former L.M.S.R. show the oil consumption in this type of box to be in the region of 3 oz. every 5,000 miles for each coupled axlebox (Timken bearing). As the vital parts are of hardened steel, wear is naturally at a much lower rate than in the plain type of box having softer metals in wearing contact. Furthermore, manganese-steel liners are provided in the roller-bearing axlebox to take the thrust on the horn faces, and wear is thereby greatly reduced.

On tests carried out some years ago on the Buenos Ayres Great Southern Railway two trains were used, one with plain bearings and the other with roller

bearings. The weights of the two trains were almost identical, the roller-bearing train scaling 290 tons, and that with plain bearings 284 tons. The tests covered a distance of $4\frac{1}{2}$ km., starting in every case from the same point. The roller bearing test was taken as a basis, and the plain bearing test was made with the engine working with the same steam pressure and expansion as in the roller bearing test.

Comparison No. 1

17.9 per cent. decrease in energy consumed in ft.-lb./sec.
18.1 per cent. increase in equivalent constant acceleration
10.9 per cent. increase in final speed attained in $4\frac{1}{2}$ km.

Comparison No. 2

9.9 per cent. decrease in energy consumed in ft.-lb./sec.
34.3 per cent. increase in equivalent constant acceleration
18.5 per cent. increase in final speed attained in $4\frac{1}{2}$ km.

When making the test for comparison No. 2 the drawbar pull for the train fitted with plain bearings was kept as near as possible to the same as that obtained with the roller bearing train. A further gain achieved by the use of anti-friction bearings is in the life of the axle, as the roller races take any wear that may occur, and these are easily renewed. As the roller bearing surrounds the axle completely, it provides ample support for braking forces where these occur; in the plain bearing the pressure exerted by the brake block tends to cause slack fitting brasses to ride up on the journal, since the actual bearing only extends for approximately

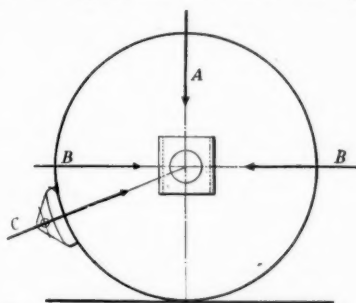


Fig. 1—Diagram showing forces acting through locomotive driving axlebox due to deadweight, driving, and braking forces

have been introduced with excellent results from several points of view, and this article shows the extent of the field now being captured by the ball or roller bearing.

Advantages

Advantages which have been realised in the railway industry by the use of these bearings can be stated briefly as follows:—

(1) Lower starting and running resistances, and, therefore, a saving of engine power for a train so fitted. Tests have shown that starting resistance can be reduced by as much as 85 per cent. or thereabouts where roller-bearing axleboxes are provided, though the reduction in friction is not so pronounced at high speed, this being around 10 per cent.

(2) Reduced charges for inspection and maintenance.

(3) Fewer hot boxes, resulting in an increased availability factor.

(4) More economical use of lubricant.

(5) Maintenance of axle and valve gear centres as designed, by virtue of the absence of wear.

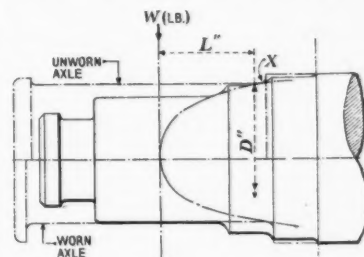


Fig. 2—Axle stress diagram

one-third of the periphery of the journal.

The stressing of an axle for the journal load it is to carry may be done on the following lines, this procedure also enabling a designer to ensure that the axle for a roller bearing box is at least as strong as the plain bearing axle which it supersedes. The method covers either the new or the worn axle as indicated in Fig. 2, and is based on the strength of the axle in the neck at X. Assume the maximum journal load to be W (lb.).

The bending moment = $W \times L$

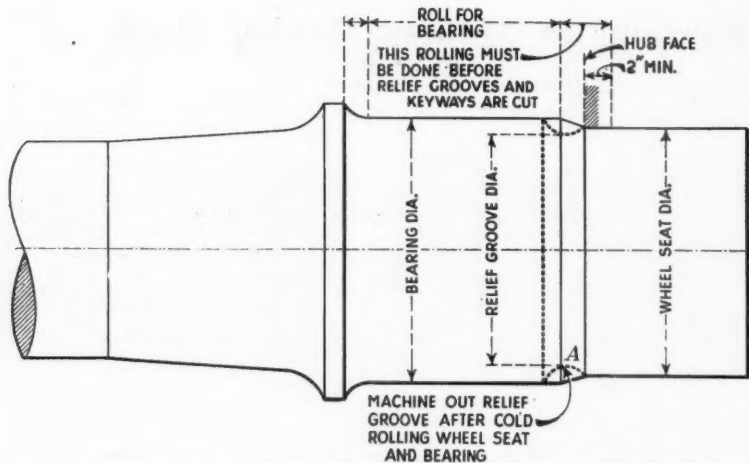


Fig. 3—Design of inboard type of axle, showing the cold rolling and stress relief groove

The moment of resistance = $Z \times f_t$ where Z = section modulus, and f_t = maximum fibre stress (lb. per sq. in.)

Equating these terms we obtain

$$W \times L = (\pi D^3 \times f_t) / 32$$

$$f_t = (32WL) / (\pi D^3)$$

$$\text{and } D = \sqrt[3]{(32WL) / \pi f_t}$$

Thus, if similar values are taken for f_t varying values for L will produce corresponding values for D , and a curve can be plotted to show values of D and L to the same scale.

Research on Axle Failures

Considerable research has been devoted to the cause of axle failures, with a programme of photo-elastic analysis to study the stress concentrations set up in the region of axle fillets and the wheel hub. Most fatigue cracks were traced to the wheel seat, and experiments were carried out to ascertain how best fatigue resistance of the axle at its most vulnerable points could be improved.

One method which seemed to give the most beneficial results was by surface rolling (or burnishing) and it was proved that axles having rolled wheel seats 12 in. dia. showed a 100 per cent. increase in axle life as compared with unrolled axles of similar size. Sufficient roller pressure is applied to deform plastically the surface layers of the axle, and no other method was discoverable which yielded such good results with so small an outlay. An additional benefit was obtained by the provision of a stress relief groove as at A in Fig. 3, the chain dotted groove being cold rolled under a suitable loading after it has been machined to size; the machining is done *after* the bearing and part of the wheel seat have been rolled.

A considerable gain accompanies the use of the taper roller bearing in that its design inherently resists axial thrusts, boxes so fitted being arranged on every axle to resist the thrusts from either direction equally. Owing to space and load-demand factors the axlebox at each side may have only one bearing,

as shown in the top illustration on page 41, and the inclination of the roller axial centres will, therefore, be reversed in opposite boxes.

Where space permits or the load compels, a double row of bearings will be provided as illustrated at the bottom of page 41, and each box then takes its

the axial thrust taken by the central ball location bearing. The box and the distance pieces between the outer races are made in halves, as also the outer race of the location bearing to permit assembly and facilitate examination of the ball tracks.

Inspection of ball and roller tracks is accomplished by removing the axle-box shell and the distance pieces; the outer races and rollers then can be moved laterally, affording a clear view of all tracks. The balls and their cage can also be moved laterally to allow a proper view of the ball track.

For the trailing truck, axleboxes similar to that shown in the top left-hand illustration on page 44 are frequently provided, and as this design is satisfactory for the tender axles, it is often possible to duplicate the boxes for these two classes of axles. It will be noticed that the roller surfaces of each bearing are inclined towards its companion, but the reverse arrangement is sometimes advisable, as in the top right-hand illustration on page 44. In the former the bearings, with their inner and outer races, are quite distinct, and adjustment will be by spacer ring and shims, while the latter box covers for a solid dual-race ring on the axle, with independent races in the box housing.

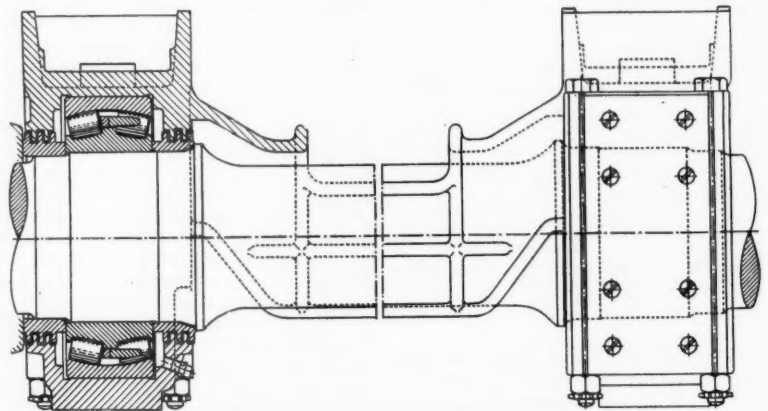


Fig. 4—SKF cannon axlebox for driving axle

share of the end thrust. With the plain bearing box, axial thrust must be resisted by the wheel boss pressing on the adjacent face of the axlebox, and as both faces are comparatively soft, appreciable wear is inevitable.

Another type of cannon box is used frequently for the driving and coupled axles (see Fig. 4) and has proved most successful. The design of the connecting walls in this unit between the two boxes has been arranged to afford clearance at the centre for the connecting and eccentric rods of the inside engine on a 3-cylinder locomotive.

In many engines independent boxes are frequently preferred, and, indeed, are often the only workable solution. In such a case the coupled axlebox shown in Fig. 5 provides an excellent bearing, the journal load being sustained by two sets of heavy rollers, and

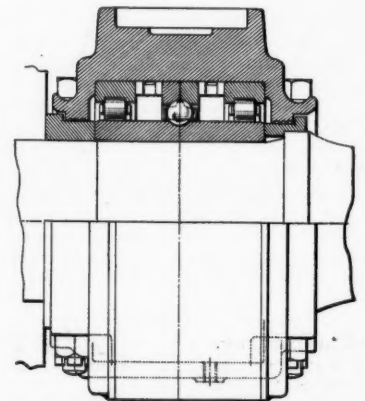
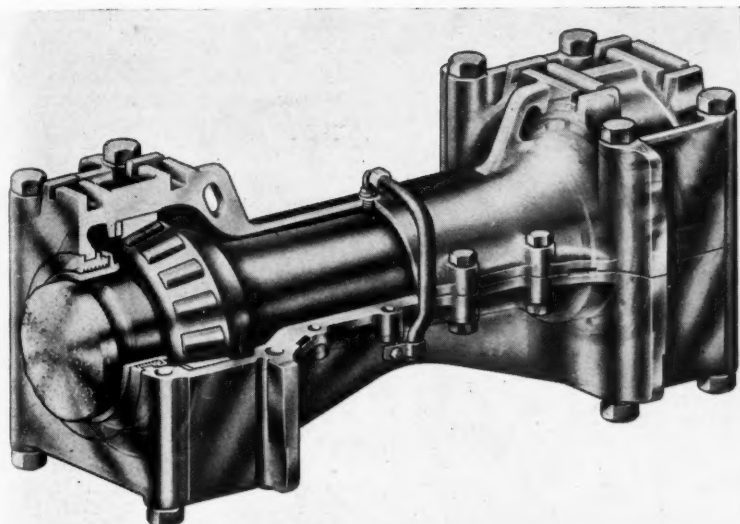


Fig. 5—Modern design of single driving axlebox, Hoffmann



Split cannon axlebox for locomotive leading bogie, British Timken

Another design of roller-bearing box which has proved efficient for locomotive trucks is shown in Fig. 6. This unit is fitted with dual bearings of the well-known spherical roller-bearing type, each bearing having spherical outer race and a double row of rollers operating therein. Where a single bearing only is necessary, the box becomes

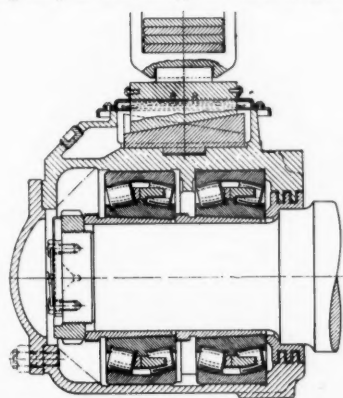


Fig. 6—Locomotive truck axlebox with SKF spherical roller bearings

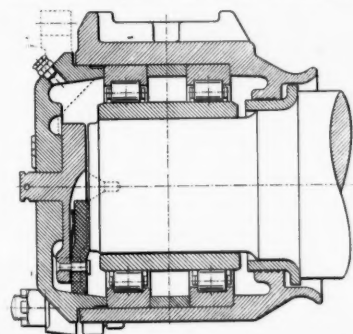


Fig. 7—Truck axlebox with parallel roller bearings, Hoffmann

entirely self-aligning, and will accommodate itself on the axle to any condition of track. In the design shown the inner races are secured to the axle by coned sleeves, the sleeve being split and easily withdrawn by means of the screwed outer collar. In the type shown at the bottom of page 44 the axlebox housings are formed as part of the bogie framing, and, apart from the increased deadweight, provide a snug assembly.

A further design of box for service on axles with outside bearings—truck or tender—is shown in Fig. 7. In this unit the load is carried on parallel rollers, two bearings being used in conjunction with a common inner race; axial thrust is resisted by a phosphor-bronze thrust pad as shown. As the

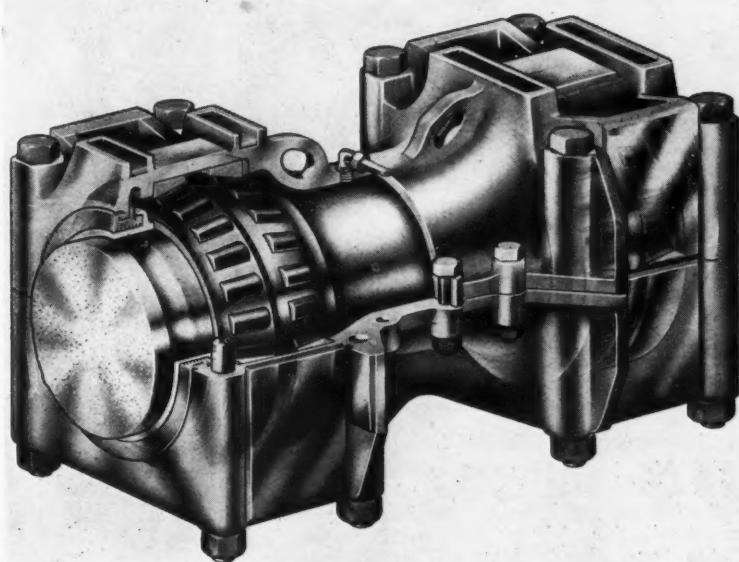
ends of the axle must have a proper bearing finish, stamping which is normally arranged on this surface will be carried out on the small stepped portion of the axle diameter which extends outwards beyond the inner race. A felt pad, let into the face of the metal pad, assists in maintaining the lubrication of the end surface, contact with the axle being by means of a spring.

Electric Locomotives

A compact arrangement for the quill on the driving axle of an electric locomotive is shown in Fig. 8, the quill revolving on spherical roller bearings supported on the motor casing. In this design one of the two quill bearings locates the quill axially, and the two rotor bearings of the motor have a relatively large amount of axial play permitted to ensure accurate meshing of the rotor pinions with the helical gears on the quill.

Other spheres lend themselves to the use of roller and ball bearing, and as the resistance to motion of any vehicle is equal to the sum total of the friction of every bearing, by a reduction at each point the net value of the engine power available is increased. The next sphere to be tackled was not unnaturally that of the coupling and connecting rods, Fig. 9 shows an assembly in which spherical rollers are used for these and for the eccentric rod bearing on the return crankpin. These have shown excellent aligning properties and remarkable mileages between shed day examinations.

As already mentioned, one advantage of roller bearings in the driving rods and valve gear is the maintenance of centres as designed, and the absence of wear cuts out all knocking and clanking as is evidenced when a locomotive with worn bushes in these members traverses an intricate crossing. Further



Split cannon axlebox for locomotive driving axle, British Timken

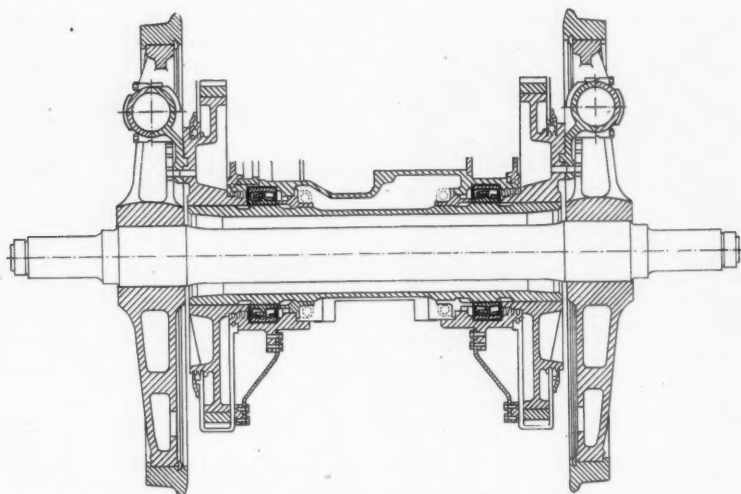


Fig. 8—SKF spherical roller-bearings for quill on electric locomotive

benefits available with some types of bearing are lighter rod design and lower machining costs. Two arrangements of rod are possible, namely, that in which the drive to the rear pin is by twin rods, the other having a single rod only. Sectional details for the driving pin bearings are shown in Fig. 10, and for the leading and trailing pins in Fig. 11. (In Fig. 10 the single rod drive is allowed for.) Lubrication of each bearing is achieved by the provision of a chamber in each crankpin through which grease is fed under pressure to all bearings in that pin. The housings serve as floating bushes, and revolve in bushes in the rods.

For some years the taper roller bearing has been applied to the crosshead also, and a layout of one of these, designed to use the Pennsylvania multiple bearing type of guide bar, is seen in Fig. 13. In this arrangement the gudgeon pin is forced into the connecting rod small end, and lubrication is by gun up the centre of the pin. The wearing surface section of these crossheads is formed of extruded aluminium, with all surfaces protected by pure tin. With this design the weight of the crosshead can be reduced approximately 50 per cent.

In valve gear linkages it is most important that no slack be allowed in the pin joints, since this means an erratic motion of the valve, and many engineers consider there is a wide field in this section for the needle roller bearing. Two joints are shown in Fig. 12 representing the attachment of the eccentric rod in a Walschaerts valve gear to the reversing link; the joint at A is fitted with ordinary rollers, and that at B with needle rollers.

Passenger and Goods Vehicles

The chief items on passenger and goods vehicles which benefit by the application of roller or ball bearings are naturally the axleboxes, and several of the types already illustrated are equally applicable to these vehicles. Axleboxes vary in many features to suit

the work to be done and the space available for housing them. For coach bogies the type shown in Fig. 14 is

often used, having a single row of rollers for each bearing; sometimes a box with dual races, as shown in Fig. 15, is necessary. In each case the boxes are formed as castings, and are as near perfect in their retention of lubricant, and the exclusion of dust and grit, as is possible.

The bogie pivots on most units take a heavy load and can be fitted with roller bearings. Although this fitment has only a small angular movement, it is very desirable that it should absorb a minimum of friction on stock which runs at a quick average speed (as on the London Underground), or negotiates many curves in a small mileage (as on narrow-gauge lines). Even on very heavily loaded bearings—as in the case of turntables—such a bearing will give negligible wear and extreme freedom of movement, especially when the outer rollers are also mounted on ball or roller bearings, and the removal of any wear risk at such points has a further gain in reducing the necessity to strip and machine worn surfaces.

Anti-friction bearings as already described are used at many points in

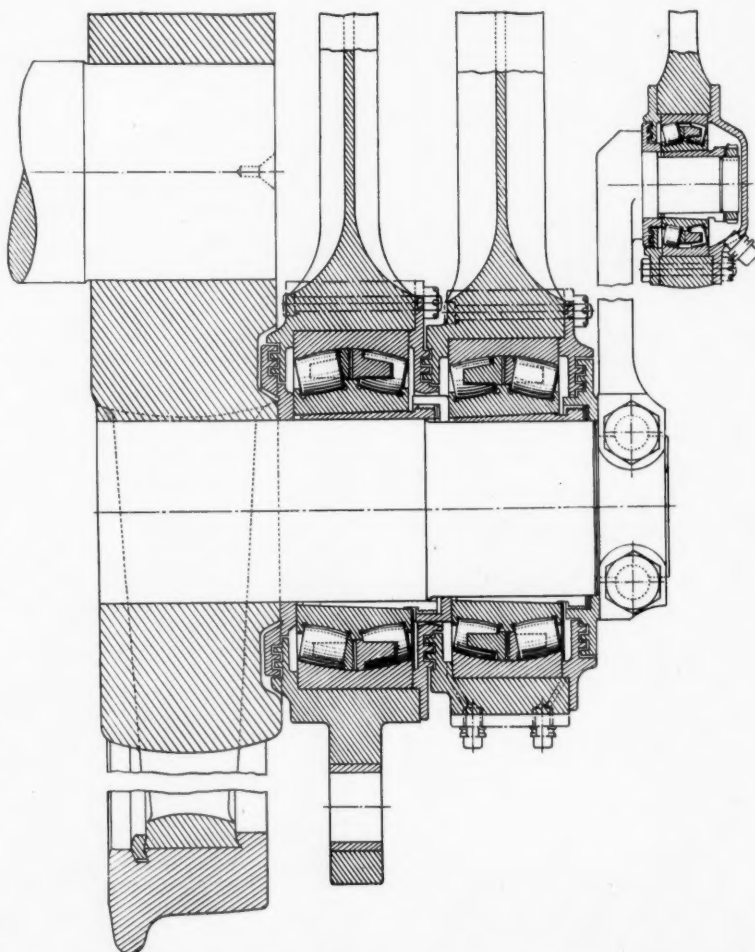


Fig. 9—Arrangement of big-ends and eccentric rod fitted with roller bearings, SKF

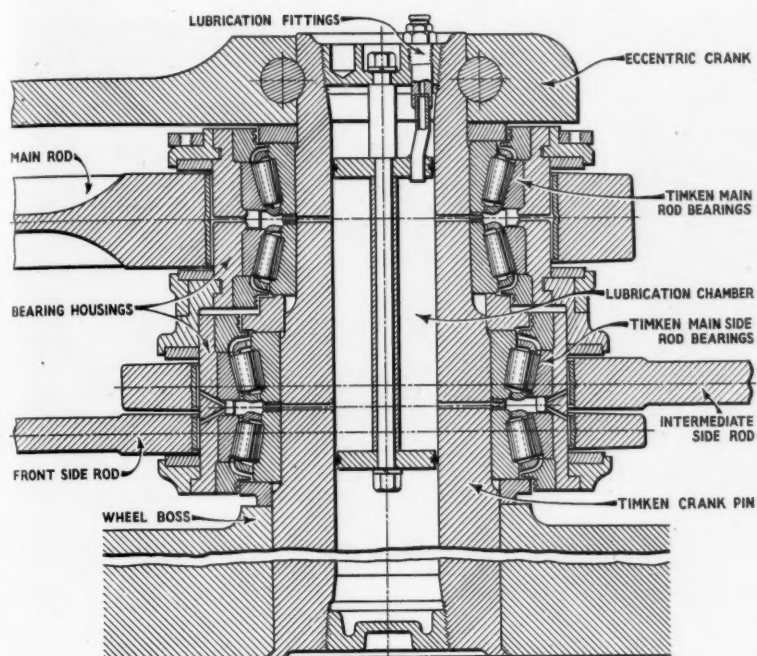


Fig. 10—Arrangement of roller bearings for rods at main crankpin, British Timken

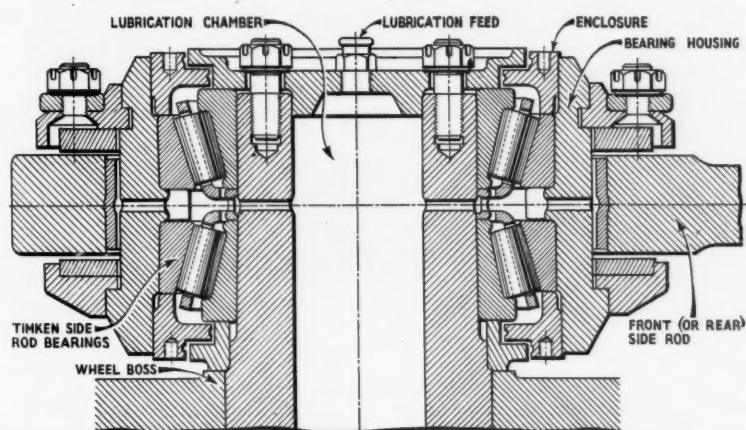


Fig. 11—Arrangement of roller bearings for coupling rods at leading or trailing wheel, British Timken

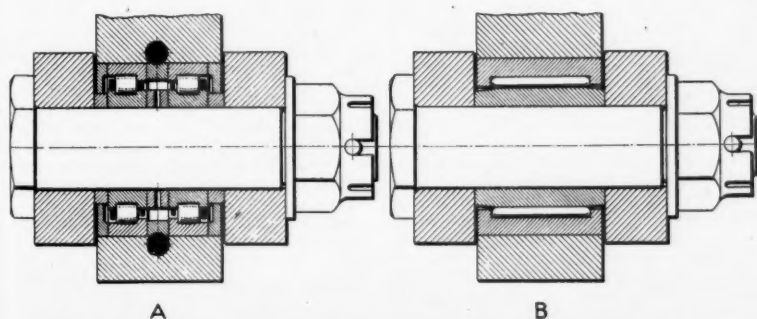


Fig. 12—Typical roller bearings for valve gear joints, Ransome & Marles

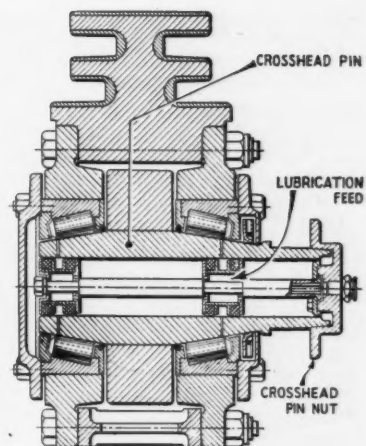


Fig. 13—Crosshead arrangement showing gudgeon pin mounted in roller bearings, British Timken

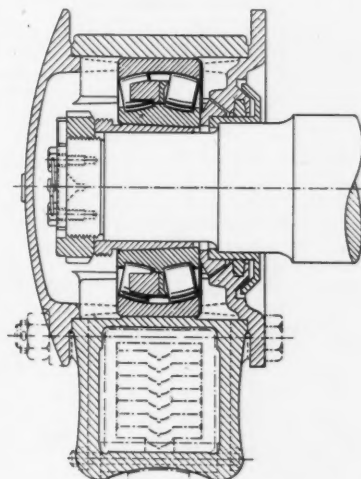


Fig. 14—Single bearing tender axlebox, SKF

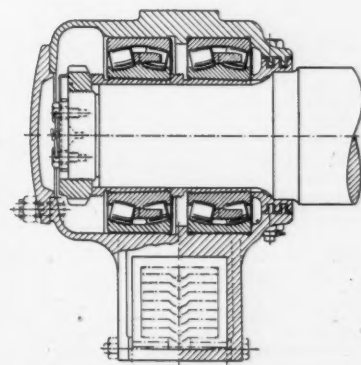
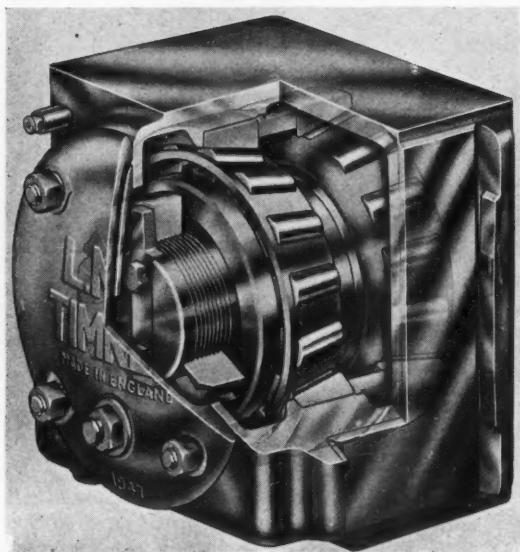
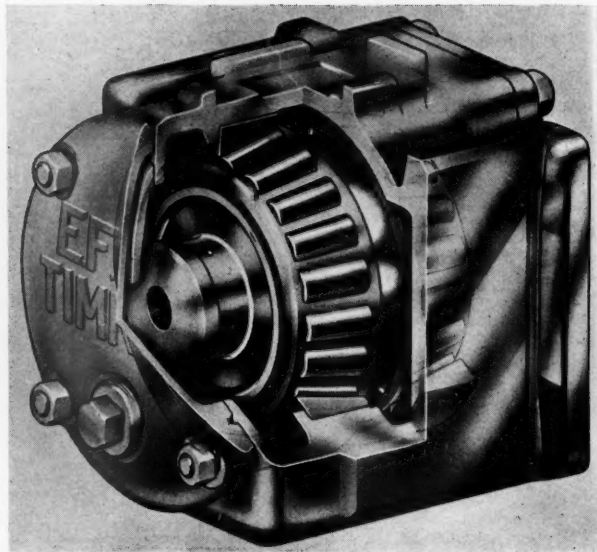


Fig. 15—Dual-bearing tender axlebox, SKF



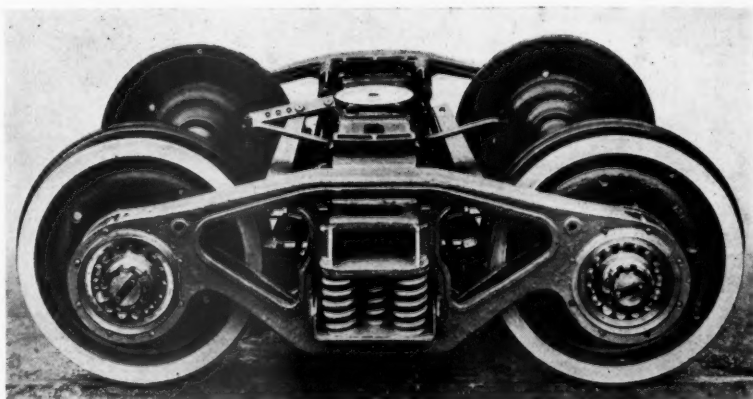
Locomotive truck axlebox with single bearings, British Timken



Locomotive truck axlebox with dual-race bearings, British Timken

diesel engine vehicles, and include the engine, in which roller and ball bearings have been fitted to crankshaft bearings—main as well as connecting rod ends—armature bearings in generators and motors, gearboxes of all types, fans, compressors and exhausters, and several other small components.

In total they give a considerable overall reduction in frictional losses, and thereby an appreciable saving in engine power and fuel consumption. A slightly higher initial cost is entailed, as admittedly these bearings are more expensive than the plain bearing, but the extra cost is soon repaid in service life and availability. The materials used today have been tested thoroughly in service, and failure of such bearings are extremely rare occurrences.



Tender bogie with axlebox housings formed solid with framing, SKF

EUROPEAN TRANSPORT POOL CONFERENCE.—The French Government has decided to propose a conference in Paris in the near future to establish a European transport pool on a plan based on that already examined by the Council of Europe in Strasbourg, where it was proposed by M. Bonnefous, Chairman of the French National Assembly Foreign Affairs Committee. The proposals include co-ordination of rates and measures for technical improvement of the different forms of transport. The French Government has suggested inviting to the conference the member countries of the Council of Europe, and also Austria, Portugal, and Switzerland.

THE NICKEL INDUSTRY IN 1951.—Dr. John F. Thompson, Chairman & President of the International Nickel Company of Canada, said recently that the free-world production of nickel for the full year of 1951 would approximate 295,000,000 lb., an increase of more than 10 per cent. over 1950. Canadian producers were responsible for 275,000,000 lb., or more than 90 per cent. of the free-world total this year,

and in 1950 Canada produced 247,000,000 lb. of nickel in all forms. Reliable estimates of nickel production in Soviet Russia and satellite countries were not available. Measures to maintain free-world superiority in nickel supply were taken during the year by established nickel producers as well as new potential producers; and these efforts would assure continuance of the amounts now available and was expected by the year 1954 to provide an increase of approximately 30 per cent. over quantity of nickel available before the Korean war.

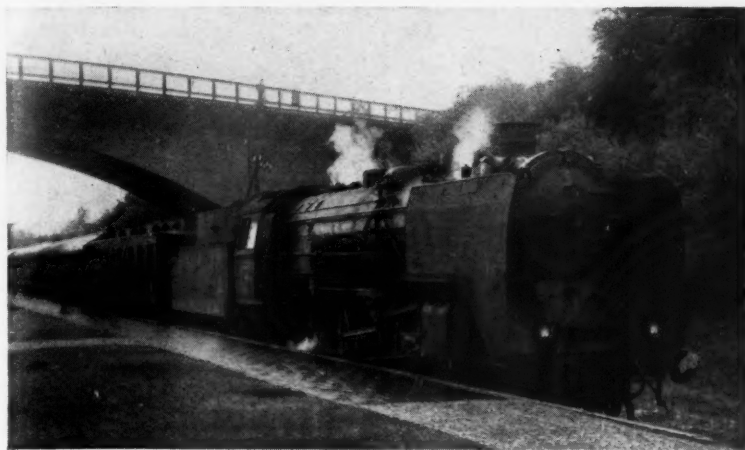
R.H.A. AND DENATIONALISATION OF ROAD HAULAGE.—Replying to the toast of the Association at the R.H.A. Coventry Sub-Area dinner-dance at Kenilworth on December 21. Mr. R. Morton Mitchell, Chief Executive Officer of the Road Haulage Association, said that when the Association deputation met Mr. Maclay, Minister of Transport, on December 12, as recorded in our issue of December 21, it had put quite clearly to the Minister the arguments in favour of proposals for amending the Transport Act. Denationali-

sation of road haulage, added Mr. Morton Mitchell, was a major domestic issue in the recent General Election, and he believed the Government would introduce early legislation to deal with it. When legislation was passed and the road haulage industry regained freedom of operation, the results should be a reduction in the number of "C" licences (because traders would regain lost confidence in road haulage when it was denationalised), co-operation with the railways in dealing with common problems and the special problem of the railways themselves, and an improved relationship with organised labour, on the footing of freedom to negotiate without the treat to both unions and employers of totalitarian action by bureaucratic dictation.

TREE HIT BY TRAIN.—A Deeside line train from Ballater to Aberdeen recently ran into a tree blown down across the permanent way near Culter. Windows were broken. The train crew, helped by some of the passengers, removed part of the tree entangled in the bogie. The train reached Aberdeen 50 min. late.

Great Belt Ferry, Danish State Railways

*A railway link of international significance
between Copenhagen and the West*



"Holland-Scandinavia Express" at Flensburg, the German-Danish frontier station, hauled by German Federal Railways 4-6-2; the leading, third class coach is attached for local traffic

Photo]

[R. A. Baxter

THE train ferry over the Great Belt, between Korsør in Zealand and Nyborg in Funen, some 16 miles, is the only rail connection between Zealand and the centre and west of Denmark, so that all railway traffic to and from Copenhagen, and much traffic between Sweden and Norway on the one hand and Western Germany and beyond on the other, both goods and passenger, must pass this way. Traffic is heavy and increasing, as the following table shows:—

	1938-39	1947-48	1949-50	Increase per cent. over 1938-39
Passenger vehicles (axles)	126,000	148,000	199,000	58
Goods wagons (axles)	385,000	534,000	593,000	54
Road vehicles ...	174,000	185,000	203,000	17

This heavy increase is due to several causes. Before 1940, most of the traffic between Sweden, Norway, Denmark and the South went by the Trällebörg-Sassnitz and Gedser-Warnermünde ferries; these are now used only by traffic to and from countries behind the Iron Curtain. Thus, before the war, only one international passenger service crossed the Belt daily—the one daily through sleeping car between Copenhagen and Paris worked in the "Nord Express" west of Hanover; today, there are the "Nord," the "Scandinavia-Italy," and the "Scandinavia-Holland" expresses, and supplementary trains during the holiday season. That means that one vehicle daily each way before the war has now become four or more trains daily in each direction. In internal Danish traffic, the "Lyntog" diesel

trains are taken over, and the number of these services has increased since the war.

Most goods traffic to and from Sweden formerly used the Trällebörg-Sassnitz route, but today practically all of it goes by the Great Belt. There has been a great increase in the transport

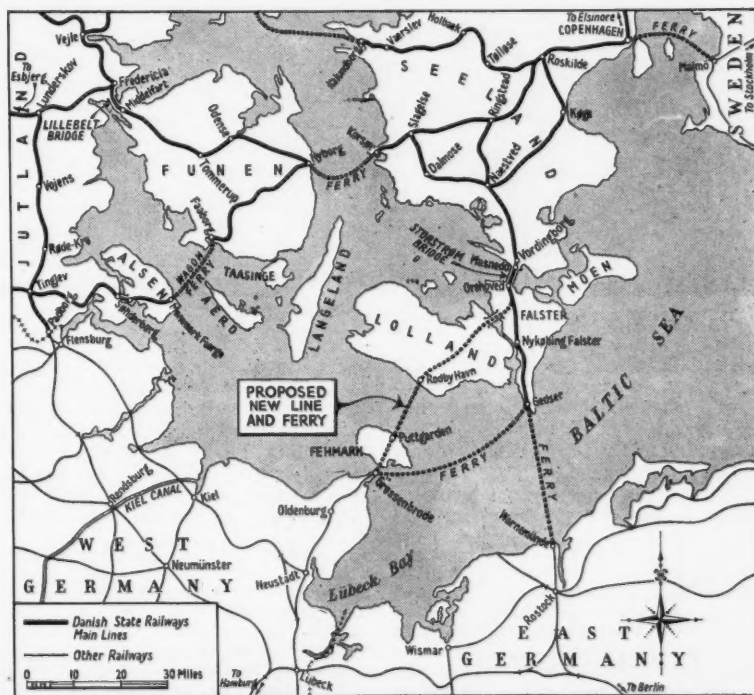
of German-built road motor vehicles on flat railway wagons to Sweden.

The number of railway vehicles taken over does not vary greatly, whereas the number of road vehicles is far higher during the summer months. To cater for this traffic, the Danish State railways have at present five diesel ferries, each with three tracks on the main deck and an older steam ferry with only two tracks. There are also two ferries for motorcars.

The ferries together made in the year ending April 1, 1950, about 30 round trips per day, and 3,856,000 passengers were carried. At Korsør and at Nyborg there are three train-ferry berths and one motorcar ferry dock. The motorcar ferries have a different form of stern and require separate berths.

Peak Traffic Difficulties

Post-war traffic increases have caused serious difficulties in operation, largely the result of intensive user of ferryboats and docks. In the summer of 1950 traffic restrictions were necessary, including the suspension for some weeks of certain international passenger coach crossings by the day ferry services; passengers' luggage was unloaded at the ferry terminal into a goods wagon which was conveyed by the ferryboat, and baggage re-loaded into the passenger train at the other terminal.



Existing and proposed rail-ferry routes between Denmark and Germany

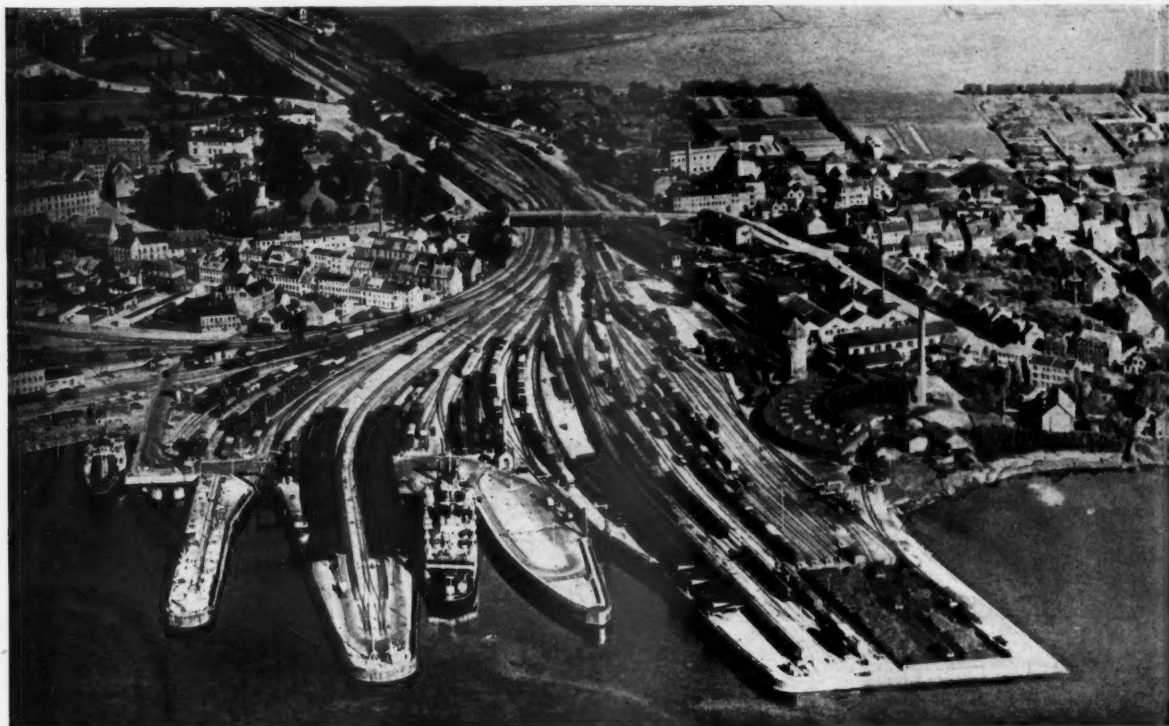
Plans for improving communications between Copenhagen and the West include a bridge over the narrowest part of the Great Belt. This would be 12 miles long and cost Kr. 1,200 million (about £60 million); although work on the bridge is unlikely to start for some time, the State Railways are conducting investigations on the site.

New Ferryboats

Meanwhile, a new diesel ferryboat has been ordered, bringing the number of such vessels up to six, so that it will be possible at peak traffic periods to have five vessels in service and one under repair. A third motorcar diesel ferry with a speed of 18 knots is on order, due for delivery in the Spring of 1952. In addition, one more ferry dock will be built at both Nyborg and



Copenhagen to Gedser express at Norre Alslev, south of Storstrom Bridge, hauled by Class "E" 4-6-2 locomotive built by Frichs of Aarhus in 1940
[R. A. Baxter Photo]



Station and berths at Nyborg, on the Funen shore of the Great Belt, showing (centre background) Nyborg Town Station

Korsor. The new motorcar ferry will have the same form of stern as the railway ferryboats, and the existing motorcar ferries may be rebuilt with the same form of stern, so that all ferry docks will be interavailable.

A new railway ferry route between Denmark and Western Germany was

opened in the summer of 1951, when the ferry service started between Gedser and Grossenbrode in Schleswig-Holstein, north-east of Lübeck. For the time being, the service is confined to railway wagons and to road vehicles, but passengers are through booked, with boat trains on either side, as recorded in

our issue of December 28. Work also was begun during the war, but subsequently stopped, in the Danish island of Lolland, on improving rail communication with Rodby, whence a train ferry is planned to the German island of Fehmarn. No work was put in hand by the German authorities.

BRITISH ROAD SERVICES VEHICLE LIGHTING.—British Road Services vehicles in the interests of additional safety will in future be fitted with two rear lights showing a larger red orifice. There will be two separately wired lamps in each, as well as special filaments to reduce risk of failure. In addition red reflectors will be fitted at each side and a white area will be painted

at the rear of each vehicle. There are now more than 40,000 vehicles of British Road Services on the road, many of which, although complying with present safety regulations, are not up to the standard of rear lighting considered desirable by the Road Haulage Executive. These will be dealt with as fast as the necessary materials can be obtained.

INCREASE IN UNITED KINGDOM AIR TRAVEL.—The number of air transport movements recorded at United Kingdom aerodromes in November, 1951, was 11,142 or 5.2 per cent. more than in the same month of the previous year. Passengers totalled 140,425, an increase of 39 per cent., and freight on and off-loaded amounted to 3,169 short-tons, which was 13 per cent. more.

RAILWAY NEWS SECTION

PERSONAL

Mr. C. S. McLeod, Assistant Regional Staff Officer, Eastern Region, has been appointed Regional Staff Officer, Eastern Region.

Brigadier L. Manton, D.S.O., O.B.E., M.Inst.T., who has retired as Principal, British Railways School of Transport, Derby, had a distinguished military career connected largely with the training of army personnel at the Railway Training Centre, Royal Engineers, Longmoor. Before the first world war, Brigadier Manton served with the Indian State Railways, on the construction and traffic sides, and in 1914 went to France with the Sappers and

The Scottish Region has announced the appointment of Mr. L. E. Marr, Assistant Commercial Superintendent, as Manager, Clyde Shipping Services.

Mr. J. C. Rogers, Assistant District Operating Superintendent, London (Western), London Midland Region, who, as recorded in our November 30 issue, has been appointed District Operating Superintendent, Liverpool (Cheshire Lines), was educated at Charterhouse and joined the L.M.S.R. in 1932, becoming a traffic apprentice towards the end of that year. After training in various departments, he was in 1935 appointed as a runner attached to the Divisional Superintendent's Office at Crewe, and was located at different times

The Council of the Institution of Railway Signal Engineers has nominated Mr. T. S. Lascelles as President of the Institution for 1952, and Mr. J. H. Fraser as Vice-President. Mr. T. Austin will become Senior Vice-President.

We regret to record the death on January 3 of Mr. James Voase Rank, Director of the Great Western Railway Company from 1942 until nationalisation. A memorial service was held at Wesley's Chapel, City Road, London, on January 7.

Mr. F. Fawcett, A.M.I.C.E., Assistant District Engineer, Walsall, London Midland Region, who, as recorded in our November 30 issue, has been appointed



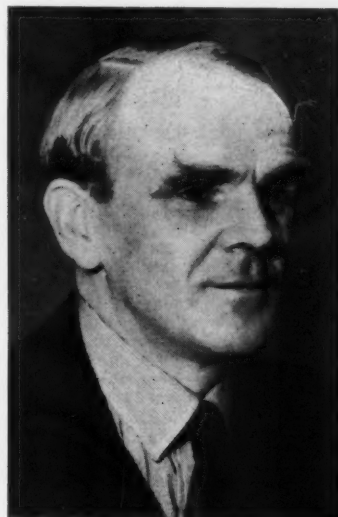
Brigadier L. Manton

Principal, School of Transport, Derby, L.M.S.R. and British Railways, 1937-51



Mr. J. C. Rogers

Appointed District Operating Superintendent, Liverpool (Cheshire Lines), London Midland Region



Mr. F. Fawcett

Appointed District Engineer, Derby (South), London Midland Region

Miners. Soon afterwards he was transferred to the transport work on which he was engaged for the rest of the war. He was awarded the D.S.O. in 1917. On the cessation of hostilities Brigadier Manton became Instructor in Transportation at the School of Military Administration; from 1922-26 he was on the Rhine, first as President of the Inter-Allied Railway Sub-Commission at Cologne, and later as British Member of the Commission itself and A.Q.M.G. (Movements) Rhine Army, at Wiesbaden. Brigadier Manton was again engaged in railway work in 1930, when he was appointed to command the Railway Training Centre, R.E., which command he held for four-and-a-half years. In the autumn of 1935 he went to Egypt as Assistant Director of Transportation, and early in 1936 he became Chief Engineer, Malta, vacating this position to become Principal of the L.M.S.R. School of Transport at Derby, 1937.

NORTH EASTERN REGION APPOINTMENTS
The North Eastern Region has announced the following appointments:—

Mr. W. P. Allen, District Goods Superintendent, Newcastle, to be Assistant to Commercial Superintendent (Freight), York.

Mr. Lancelot Ballan, District Commercial Superintendent, Hull, to be District Goods Superintendent, Newcastle.

at Wigan, Chester, Preston and Crewe. Mr. Rogers was appointed Assistant District Controller at Leicester in 1940, and was transferred to the Passenger Services Section of the Divisional Superintendent's Office at Crewe in 1942. In 1943 he was appointed Assistant District Controller at Leeds and was transferred to Chester in a similar capacity in 1944. After a period as Assistant Divisional Controller, Passenger Services, at Crewe in 1945, Mr. Rogers was appointed Assistant District Traffic Manager (Traffic Operating) at Chester on the formation of the District Operating Manager's office there in 1946. He became Assistant District Operating Manager at Rugby in 1947, and was transferred in a similar capacity to Leicester in the following year. Mr. Rogers was appointed Assistant District Operating Superintendent, London (Western), located at Euston, in 1948.

The members of the Marine Committee of the Railway Executive recently held a farewell meeting in London for Captain W. L. Sinclair, Chief Marine Superintendent, London Midland and Western Regions, who is shortly retiring from the railway service. On behalf of the members of the Committee, the Chairman, Mr. J. L. Harrington, Chief Officer (Marine), presented Captain Sinclair with an electric chiming clock.

District Engineer, Derby (South), started his railway career on the L.M.S.R. as a junior draughtsman in the District Engineer's office at Blackburn in 1925. After gaining experience, he became Hallade Assistant in the Divisional Engineer's office at Manchester in 1932 and became a draughtsman in the same office a year later. In 1935 he was transferred to the Chief Engineer's Office, structures section, at St. Pancras, where he remained until 1939, when he was made responsible for supervising the new Railway Executive Committee wartime headquarters in a disused underground station in London. Mr. Fawcett was appointed Resident Engineer at Wolverton in 1940, for the erection of the shell forging plant in the carriage & wagon works, and was then appointed Engineering Assistant to the District Engineer, Northampton in 1943. Two years later he became Assistant District Engineer, Barrow-in-Furness, and in 1946, Assistant District Engineer, Walsall. Mr. Fawcett has also been a member of the panel for organising classes for the education of artisan staff.

We regret to record the death on January 7 of Mr. T. B. Stewart, O.B.E., Commercial Superintendent, Buenos Ayres Great Southern and Buenos Ayres Western Railways, 1940-46.



Mr. G. W. Forder

Appointed Assistant Carriage & Wagon Engineer, Scottish Region

Mr. G. W. Forder, Assistant Carriage & Wagon Works Manager, Eastleigh, Southern Region, who, as recorded in our December 21 issue, has been appointed Assistant Carriage & Wagon Engineer, Scottish Region, joined the L.S.W.R. in 1919 as an apprentice in the Carriage Works at Eastleigh. He remained at Eastleigh and after experience in the drawing office was appointed progress of work inspector in 1928. In 1931 he became junior assistant to the Carriage & Wagon Works Manager, Eastleigh, Southern Railway, and ten years later was appointed Assistant to Works Manager, Carriage Shops, Eastleigh. Mr. Forder became Assistant Works Manager, Carriage & Wagon Works, Eastleigh, in 1943.

The Railway Executive announces that Lt.-Colonel W. Seton Anderson, Railway Executive Staff Training School, Derby, has been appointed Principal, Railway Executive Staff Training Schools, Darlington.

The Minister of Transport has appointed Mr. W. P. James to be Licensing Authority for the West Midland Traffic Area, in succession to Mr. R. Stuart Pilcher, who retires under the age limit on January 29.

INSTITUTION OF LOCOMOTIVE ENGINEERS

The Council of the Institution of Locomotive Engineers has made the following nominations, which will be put to a general meeting to be held on January 16, to fill the vacancies occurring at the end of the present session (May 31, 1952):—

President: Mr. C. M. Cock; Vice-Presidents: Messrs. R. Arbutnot, R. C. Bond (to retire May 31, 1955); Members of Council (to retire May 31, 1954): Messrs. J. F. Alcock, G. Collingwood, J. F. Harrison, Ronald J. Harvey, M. S. Hatchell, H. Holcroft, E. Pugson, E. A. Robinson, R. A. Smeddle, W. L. Watson.

The following remain in office for another year or longer:—Vice-Presidents: Messrs. A. Campbell, K. J. Cook, R. F. Harvey, J. F. Vidal; Members of Council: Messrs. D. C. Brown, E. S. Cox, I. C. Forsyth, G. C. Gold, W. G. Hornett, L. J. Le Clair, J. H. P. Lloyd, A. W. Manser, S. B. Warder.



Mr. J. H. M. True

Appointed Assistant to Commercial Superintendent (Coal), London Midland Region

Mr. J. H. M. True, Traffic Costing Officer, Railway Executive, who, as recorded in our January 4 issue, has been appointed Assistant to Commercial Superintendent (Coal), London Midland Region, began his railway career on the former L.N.E.R. in the Goods Commercial Department in 1925, and served at Newcastle Forth and New Bridge Street stations, and in the Newcastle District Office. He was subsequently appointed a traffic apprentice and after training was transferred to the Mineral Manager's office at Doncaster. Serving in the Royal Corps of Signals and Royal Engineers (Movement Control) during the 1939-45 war, Mr. True became an Assistant Director of Transportation with the rank of Lt.-Colonel on demobilisation. After the war he returned to the Mineral Manager's office, Doncaster, as Chief Clerk, and was then appointed Goods Agent, Doncaster. He became Assistant to the Executive Officer (Mineral Traffic), Railway Executive, and later was appointed Traffic Costing Officer, Railway Executive.

Mr. G. Skinner has relinquished his title of Assistant Manager and assumed the duties and responsibilities of, primarily, the Inspection & Despatch Department of A.C.V. Sales Limited, as Manager.

The article on the East African Railways & Harbours in our publication "Overseas Railways 1951" should have appeared under the name of Mr. J. H. Collier-Wright, Assistant Superintendent, Transportation, and not under that of Mr. A. Dalton, General Manager.

We regret to record the death on December 27, at the age of 75, of Mr. John H. Hill, who retired as Head of Merchandise Services Section of the Chief Commercial Manager's Department, L.M.S.R., in 1937. He joined the Midland Railway in 1891, and was transferred to London in June, 1924, under the amalgamation of the Chief Goods Manager's Office at Euston. Mr. Hill was appointed Head of Transit Office in 1925 and later became Head of Merchandise Services Section, Chief Commercial Manager's Department. The cremation took place at Golders Green Crematorium on January 2.



Mr. William M. C. Scott

Appointed Stationmaster, Glasgow Central, Scottish Region

Mr. William M. C. Scott, Chief Controller, St. Rollox Control Office, Glasgow, Scottish Region, who, as recorded in our December 21 issue, has been appointed Stationmaster, Glasgow Central, is a native of Carstairs, and joined the Caledonian Railway as a clerk at Yoker Station in 1909. He gained experience at stations in Lanarkshire and Dunbartonshire and on return from Army service in 1919 was appointed to the District Superintendent's Office, Glasgow. In 1924 he was promoted to the General Superintendent's Office, L.M.S.R., Glasgow, and in 1937 became Assistant Stationmaster, Glasgow Central. In 1940 Mr. Scott went to St. Rollox as Assistant District Controller and two years later, on the opening of the Control Office at Stranraer, he became District Controller, Stranraer. He went to Motherwell Control Office at the end of 1942 and in 1948 was appointed Assistant (Temporary) to the District Operating Superintendent, Glasgow. In 1950 he became Acting District Controller, Polmadie, and in January, 1951, Chief Controller, St. Rollox. During the first world war Mr. Scott served in France with the Royal Scots and afterwards with the Royal Engineers (Railway Operating Division). For ten years he was a member of Lanark Town Council.

We regret to record the death on January 2 of Mr. H. Wood Robinson, Deputy Chief Controller of Standardisation, Indian Railway Board, 1940-48. He was educated at Portsmouth Grammar School and Llandovery College, and went to Balliol College, Oxford, in 1913; he took first class honours in Mathematical Mods. a year later. Mr. Robinson joined the Army in 1915, and served with the Royal Garrison Artillery both at home and in Mesopotamia. After the war, he returned to Oxford, passing out in 1921 with first class honours in Engineering Finals. Mr. Robinson was appointed in 1923 as an Assistant Executive Bridge Engineer on the North Western Railway, India, and in 1928 was transferred to the Madras & Southern Mahratta Railway as Bridge Engineer, a post he held until 1935, when he returned to the North Western and took over as Deputy Chief Engineer, Bridges. In 1940 he was appointed Deputy Chief Controller of Standardisation, Indian Railway Board,

where his duties included supervision of bridge standard designing and a wide range of research and experimental testing work on behalf of Indian railways. He retired in 1948.

Mr. W. Mackenzie, Chief Engineer for Docks, Humber Ports (also Middlesbrough and Hartlepoons), has retired from that position, but is remaining in the service of the Docks & Inland Waterways Executive in an advisory capacity as Engineer (General Duties).

Mr. D. A. Pearce of the Dunlop Rubber Co. Ltd. Overseas Advertising Services in London, has left this country to join Dunlop (Australia) Limited at the head office in Melbourne, where he will be responsible for the advertising of tyres and mechanical rubber goods.

LONDON TRANSPORT APPOINTMENTS

The following appointments have been announced by the London Transport Executive:—

Mr. J. D. C. Churchill, to be Planning Officer, responsible for the functions carried out by the Development & Research Officer.

Mr. D. P. Counihan, to be an Officer of the Executive, with the title of Traffic Superintendent (Central Road Services).

Mr. G. J. Dickins, to be Development Officer.

We regret to record the death on December 31, at the age of 71, of Mr. G. A. Juhlin, M.I.E.E., formerly Director & Chief Electrical Engineer of the Metropolitan-Vickers Electrical Co. Ltd. He was born and educated in Sweden and in 1902 joined Dick Kerr & Company of Preston, and for many years held the position of chief a.c. design engineer to this firm. In 1915 he joined Metropolitan-Vickers (then the British Westinghouse Electric & Manufacturing Company), and two years later was appointed Chief Engineer of the Plant Department, in which capacity he was responsible for the design of all the firm's large electrical machines. In 1941 he was appointed Chief Electrical Engineer of the company, and was subsequently elected to the board. He retired in 1947. Mr. Juhlin had an international reputation as a designer of large electric generators and motors and contributed many valuable papers to societies. He was Chairman of the North-Western Centre of the Institution of Electrical Engineers from 1923-24.

Mr. R. C. Wade, B.Sc., A.M.I.E.E., of British Insulated Callender's Construction Co. Ltd., whose death we recorded briefly in our January 4 issue, was Engineer in charge of the contract for the installation of the overhead equipment on the Manchester-Sheffield railway electrification scheme. He was born in 1905, educated at Rossall School and Birmingham University and, subsequently, joined the former B.I. Cables Company in 1928 as an engineer in the Contract Department. Between 1928-37 he had varied experience on cable and overhead line contracts and, from 1937 to 1939, was Assistant Engineer in Warsaw for the electrification of the Polish State Railways. On his return from Poland he worked as Assistant to Mr. H. B. Davies on the Liverpool Street-Sheffield electrification contract. During the war he took charge of the company's airfield contracts with headquarters at St. Neots. As soon as the Manchester-Sheffield electrification was recommenced after the war, he was appointed Resident Engineer in charge of that work.

Institution of Railway Signal Engineers

Discussion of a paper on single-line working in various countries

At a meeting of the Institution of Railway Signal Engineers in London on December 14, 1951, presided over by Mr. S. Williams, a paper dealing with non-token methods of single-line working was read by Mr. A. N. McKillop, who traced the development of the problem of single-line signalling and layout of crossing loops, the purpose and leading features of token systems with their advantages and disadvantages, the main principles and safety requirements of non-token operation, and means to be adopted to protect against irregular operation, especially the incorrect use of cancelling facilities. Reference was made to directional levers with track circuit control and to treadle control and automatic signalling systems.

Mr. F. Horler, Past-President, opening the discussion, remarked that single-line working presented probably one of the most fascinating problems in signalling. The original idea of a mechanical pilotman was brilliantly simple, but the construction of apparatus to make it effective was not quite so easy. He recalled how certain instruments had to be re-designed, following the discovery of possibilities of irregular operation, but ultimately the token system became most adequate and there was no really complete substitute without continuous track circuit.

The question of overlaps at stations was interesting—and also the divided staff system as described in the paper—for dealing with breakdowns in non-token working. He believed a patent had been taken out in France for directional levers before the initial installation in this country was made. A feature of automatic installations in America today was the extensive use of spring-returned points at crossing places.

Token Systems

Mr. C. G. Roberts suggested that all the methods described had their uses and were not really competitive. Modern token instruments used the latest materials and were produced by up-to-date processes. They provided for permissive and other kinds of working. The token was a most useful and simple way of controlling sidings. Tokenless systems had their place where traffic density, etc., called for them, and a system providing for switching out, with remote control of the closed station, axle counting, and/or track circuit as required, together with other interesting features, was expected to be available for demonstration shortly. It would be interesting to know what means of control for sidings the author would use with non-token working.

Mr. J. H. Currey made some points in favour of token systems. The necessity for balancing tokens was admittedly a disadvantage at times, but a lineman's work was practically confined to the limits between distant signals at stations, which was a comparatively short space, and he had facilities for going from one station to another. If the whole line was track-circuited he had to walk the entire length to inspect bonds, cut-section equipment, and so on, and the cost of that was high. With motor trolley maintenance they would be faced with the need to supplement the track circuit in some way to afford adequate protection, thus adding further to the costs.

Mr. B. Wagenrieder referred to the permissive tablet working as used formerly on part of the former G.N.R., which served

very well for freight trains. There was some modification of this plan today, with an intermediate block post, on an East Anglian line.

Mr. L. W. H. Lowther stressed the importance of single-line working overseas where the mileage was so great. Here the proportion of single to double track could not be great. Track circuits would not be feasible on many lines abroad. There were also many unattended sidings controlled simply by the staff or tablet. The simplicity of such working often far outweighed any advantages of track circuit control.

Mr. V. S. King said that interlocking between token instrument and signal emphasised the importance of both, but one could work with either alone, and that was done. If a token was lost or was damaged, some disturbance was created, but any system might fail at times and call for emergency pilot working. He thought the locking up treadle action could be made proof against danger failure.

Mr. J. E. Mott suggested that overseas signal engineers should send in their comments as they would be helpful and provide a new point of view. Tokens were commonly exchanged at 30 m.p.h. on some lines overseas. The sidings and loops, however, were often away from any locality, and then the C.T.C. system made a strong appeal against purely automatic signalling.

Mr. D. S. Bennett remarked that the South African Railways were very advanced in single-line working. The Van Schoor tablet instrument, now widely used, had since been developed to provide a tokenless system.

The President, moving a vote of thanks to the author, said he thought it would need substantial facts and figures if any great change in existing methods, which rested on a long and satisfactory experience, was to be brought about in this country.

MECHANICAL TESTS FOR METALS.—The strength of materials of construction and the probable behaviour of these materials under load has been the concern of designers for many years. The formulation of suitable tests by which the quality of metal products could be assessed without having recourse to full-scale testing was undertaken by the British Standards Institution as one of its earliest tasks and resulted in the adoption of a series of standard tensile test pieces. Since that time a number of standards have been issued which deal with different types of mechanical tests. The standards that deal solely with mechanical testing, together with extracts from other standards to illustrate particular applications of the tests, have been collected under one cover to form a new handbook, No. 13, and so provide a reference book useful to industry and to universities and technical colleges where the subject of strength of materials is taught. The handbook has been arranged in sections which deal with types of tests. The final section embodies a comprehensive series of conversion factors and tables, and in addition to a general list of contents and a separate list for each section an extensive index is included, and suitable running headings are given for each page. Copies may be obtained from the British Standards Institution, Sales Department, 24, Victoria Street, London, S.W.1, price 17s. 6d.

The Dundalk Newry & Greenore Railway Closed

Withdrawal of services of B.T.C.-owned company operating in both the Republic of Ireland and Northern Ireland



Locomotive No. 3 and six-wheel stock

The last train ran on the Dundalk Newry & Greenore Railway on December 31, 1951, bringing to an end a chequered career of three-quarters of a century. The line and the steamer service between Holyhead and Greenore were inaugurated in 1873, and gave the London & North Western a new route to the North of Ireland via Holyhead and Greenore.

To ensure adequate facilities for the carriage of passengers and goods to and from Greenore the L.N.W.R. guaranteed to provide the capital for the preliminary expenses, construction, and equipment of the Dundalk & Greenore Railway, which was incorporated on July 28, 1863. The Irish North Western Railway—later part of the G.N.R.(I.)—was authorised in 1862 to make a railway connecting its existing system with the quay at Dundalk, but these powers were taken over by the Dundalk & Greenore Railway by an Act of 1867.

Another Act of July 28, 1863, authorised the Newry & Greenore Railway to construct a railway connecting with the Newry & Armagh Railway—also later part of the G.N.R.(I.)—in Newry and terminating on the shores of Carlingford Lough near Greenore Point, and to construct a pier at Greenore Point. An Act (Further Powers) of July 5, 1865, gave it powers also to carry out new works, including an hotel at Greenore. On July 21, 1873, by the Dundalk Newry & Greenore Railway Act, the Dundalk & Greenore company was empowered to construct a railway between Bridge Street Junction, Newry, and the Newry & Armagh Railway at Newry, and to take over the Newry & Greenore Railway. The whole undertaking then became known as the Dundalk Newry & Greenore Railway.

Opening of the Line

The opening of the Dundalk & Greenore Railway, 13 miles 14 ch. long, coincided with the opening of the port of Greenore and the opening of the steamer route to Holyhead on May 1, 1873. The line between Greenore and Bridge Street Station was opened on August 1, 1876, and that from Bridge Street to Edward Street, Newry, on July 1, 1880, a total of 13 miles 54 ch. of track. These two lines were opened under Dundalk Newry & Greenore management.

For various reasons the Dundalk, Newry & Greenore Railway seldom earned a

profit and no return was made on the capital raised by the L.N.W.R. Its finances were seriously affected by Partition in 1922-23, which divided a large part of the hinterland of the port of Greenore. The situation was aggravated by reason of the establishment of the Customs barrier in 1923 when Northern Ireland traders campaigned for the despatch and receipt of traffic through North of Ireland ports. Traffic by the steamers decreased so much that in 1926 passenger services were discontinued from Holyhead to Greenore. A considerably reduced service on the railway operated thereafter.

Freight traffic also gradually declined; there were three sailings a week until 1938, then two until 1940, since when one sailing a week sufficed. The last sailing from Greenore to Holyhead was on December 29, when the *Slieve League* conveyed a cargo which consisted of goods, horses, and cattle.

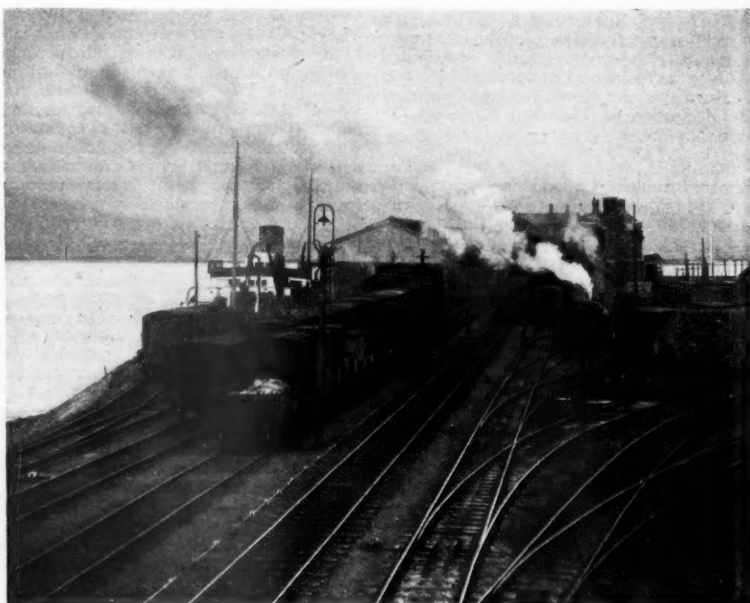
The motive power, provided by the L.N.W.R., was six 0-6-0 tank locomotives which were a 5 ft. 3 in. gauge, saddle-tank version of Ramsbottom's "DX" tender goods engines. Nos. 1 to 5, named *Macrory, Greenore, Dundalk, Newry, and Carlingford* were built at Crewe between January, 1873, and January, 1876. No. 6, *Holyhead*, was built in May, 1898. Nos. 1-5 were new engines, and No. 6 was a rebuild from a "DX" goods. No. 5 was withdrawn in November, 1928.

The Great Northern Railway (Ireland) took over working on July 1, 1933, and thereafter undertook most of the locomotive working. At the closing only two of the original six locomotives (Nos. 1 and 3) were in service.

The passenger stock consisted of six-wheel compartment vehicles and passenger vans built to the design of F. W. Webb, painted in the L.N.W.R. colours of purple-brown and spilt milk, lined out yellow, and bearing the D.N.G.R. coat-of-arms. Most of the goods traffic was carried in stock provided by the G.N.R.(I.), though the D.N.G.R. owned some 10-ton cattle wagons, 7-ton covered goods wagons, and a few open wagons.

Hundreds of passengers travelled in the last train from Newry and from Dundalk to Greenore. Many others gathered alongside the line and at the stations, where bands played the trains out.

Locomotives Nos. 1, 2, 3, 4, and 6 are now at the G.N.R.(I.) works at Dundalk. Locomotive No. 2, and one of the coaches, a first and third composite built at Wolverton in 1873, will be preserved by the British Transport Commission. The Greenore Hotel is to be maintained for the time being by the G.N.R.(I.), which bought it from British Railways at the request of the Government of the Republic; the G.N.R.(I.) has operated it since 1933. G.N.R.(I.) buses and lorries now provide passenger and goods services in the district.



View of Greenore Station and Quay

Modern Railway Signalling in Brazil

Main running signals of the searchlight type and colour-light subsidiary signals



A typical section of electrified line in Brazil

The suburban line between Roosevelt Station, Sao Paulo, and Itaquera, on the Estrada de Ferro Central do Brazil, is being electrified at 3,000 V. d.c., using overhead collection and running rail return, this distance of line being approximately 25 track-miles.

Material is being supplied by the Westinghouse Brake & Signal Co. Ltd., and entails the supply of new all-electric power frames at Vila Matilde (19 levers), Parada de Patriarca (23 levers), Engenheiro Artur Alvim (15 levers), and Itaquera (27 levers), while the existing power frames at Roosevelt, Engenheiro Sao Paulo, Sebastiao Gaulberto, and Carlo de Campos are to be modernised or extended.

Illuminated diagrams of the spotlight type will be installed in all these signal-boxes. Track circuits are of the a.c. reactance feed type with feed sets and other necessary apparatus housed in sheet steel apparatus cases of various sizes. As the track rails carry the return current for the traction system, double-rail track circuits are all to be provided with M6 resonated impedance bonds at both feed and relay ends, which provides a very low resistance return path for the traction d.c. while permitting a.c. track circuits to be used; altogether 160 track circuits are to be installed.

Method of Point Operation

The main running signals are to be of the searchlight type and subsidiary signals will be 2-aspect colour-light shunt and single-aspect light signals. Points are to be operated by all-electric point machines of style M3 for d.c. operation in conjunction with a.c. motor-driven point controllers. Relays of various types to a total of about 450 will be supplied for use with a number already held by the railway.

Briefly, the installation is conventional power signalling using signal aspects to A.A.R. standards, with short sections of automatic signalling between stations. Some of the tracks are equipped with two-way working controlled by special direction levers on the frames.

The project on the Mooca-Jundiai section

of the Estrada de Ferro Santos a Jundiai consists of Westinghouse electro-mechanical signalling combined with Sykes interlocked block. Distance covered from end to end is approximately 66 km. and involves 30 signalboxes. The scheme was necessitated by reason of the electrification of this stretch of line, the contract for which was awarded to the English Electric Co. Ltd., with which firm close collaboration has been maintained throughout the planning and installation stages.

Track circuits are used in general only for block locking and releasing. Only at some of the larger stations are track circuits provided throughout the area. Track circuits are of the a.c. reactance feed type with detachable top track relays. Because the track rails carry the return current for the traction system, all double-rail track circuits are provided with M6 resonated impedance bonds at feed and relay ends.

providing a very low resistance return path for the traction d.c. while permitting a.c. track circuits to be used; 235 track circuits are being installed.

Lever locks and circuit controllers are to be fitted to existing mechanical frames and lever locks and circuit breakers to existing ground frames. The main running signals are to be of the searchlight type, fitted in some cases with position light junction indicators, while subsidiary signals will be of the single-aspect light type.

Mechanical point layouts for single and two-lever workings are also being supplied. Full use will be made of Westinghouse detachable top relays throughout this installation, permitting rapid changing of relays without any interference with the external wiring, and various types up to a total of some 700 will be supplied.

Waterproofing a German Tunnel

In spite of their financial stringency, the German Federal Railways were unable longer to defer a major repair of the Weinsberg Tunnel between Crailsheim and Heilbronn, where large quantities of water were penetrating on to the line. This tunnel, double track and 2,950 ft. long, was built nearly 100 years ago without waterproofing. Difficulties were encountered from the outset, and in 1908 a section of the tunnel was fitted with waterproofing which did not stand the test of time.

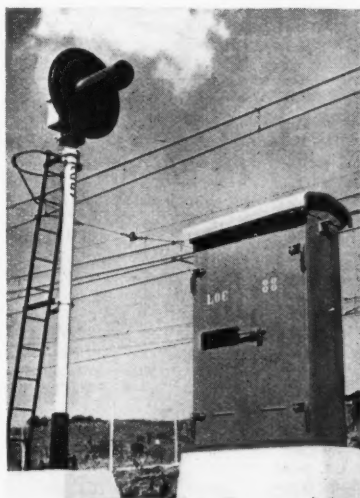
The first task to be undertaken was to rebuild the main drain of the tunnel, which could not cope with the water, at a greater depth, using 1 ft. dia. clay pipes at a depth of over 8 ft. below rail level. The tunnel is on a gradient of 1 in 119 descending towards the west. While the work was in progress the train services had to be maintained, though single-line working at much reduced speed was resorted to. Because of the heavy traffic and consequent smoke nuisance, a highly efficient warning system had to be introduced, and trains were announced by sirens as well as light signals.

Machinery for Spoil Removal

The machinery for the removal of spoil and the concrete works was installed along the disused track in a cutting, just outside the tunnel mouth on the Heilbronn side. A 100-kW. transformer, two stationary compressors, and a workshop were available on the site above the cutting. A 60-cm. track was laid to connect the tunnel section concerned with the plant installation site.

To create sufficient space for the scaffolding for the concrete works and for the 60-cm. track, the remaining single track was slewed. This slewing and the erection of the timber scaffolding had to be carried out between trains by a specially-trained team. Subsequently, a top heading of 2-m. by 2-m. cross-section was excavated above the sandstone masonry vault of the tunnel; the spoil was removed through holes cut into the crown. From the top heading, the extrados of the masonry vault was gradually excavated.

The refill consisted partly of lean concrete, partly of stone packing set in concrete. The materials were brought into the top heading by an elevator, which lifted the narrow-gauge wagons on to a



Typical searchlight signal and apparatus case location

second track leading into the top heading. The extra cost of the excavation and construction of the lift was amply repaid by the absence of interference with the train service. The top heading was left open until all the lateral zones had been caulked and refilled, and was subsequently filled with concrete and stone packing.

To reduce the construction period, the work was carried on day and night, each shift consisting of nineteen men. Even so, the work extended over fifteen months.

Staff & Labour Matters

Pay Increase for Civil Servants

Increases in pay are announced for some 600,000 civil servants with effect from January 1, 1952, the annual cost of which will be approximately £30 million.

Increases range from 10 per cent. on salaries up to £500 a year; those with higher salaries receive 10 per cent. on the first £500, 5 per cent. on any part of salary from £500 to £1,000, and 2½ per cent. on any part between £1,000 and £1,500. It is understood that a separate claim is to be submitted in respect of staff receiving more than £1,500 per annum. Examples of the increases conceded are £80 a year for a man on £1,200 and £87 10s. on £1,500.

The settlement is based on the percentage increase in the index of wage rates since January 1, 1951, which was approximately 10 per cent. up to the end of November. The award was approved at a meeting on January 3 of the Civil Service National Whitley Council. A claim for a three-year agreement providing further automatic wage adjustments for every five points rise in the wages index was rejected on the ground that the Government wishes to stop the wages-prices spiral.

Railway Shopmen's Wages

Representatives of the Railway Executive and of the employees' side of the Railway Shopmen's National Council met Sir Robert Gould, Chief Conciliation Officer of the Ministry of Labour, on January 7 in an attempt to reach settlement on the claim for a substantial pay increase for railway shopmen.

The Railway Executive made an offer late last year, as recorded in our issue of December 7. This, it is understood, was in line with the recent 8 per cent. increase accorded to other railway staff under the decision of the Railway Staff National Tribunal. The employees' side does not regard this as sufficient, in view of the all-round increase of 11s. a week for men in outside engineering. As agreement could not be reached, the matter was referred to the Minister of Labour & National Service.

No statement was made after the meeting on January 7, but the union representatives are stated to have agreed to report to their respective executive committees.

AWARDS FOR SAFE DRIVING.—Major-General B. K. Young, Director General of the Royal Society for the Prevention of Accidents, recently presented 16 drivers employed by British Road Services with awards for safe driving for periods of between 25 and 30 years. Major-General G. N. Russell, Chairman of the Road Haulage Executive, said that of a total driving strength of 36,530 in 1950 no fewer than 15,000 employees of British Road Services had qualified for an award for up to ten years' safe driving.

Reconditioned Stock for "Rheingold Express"

Prewar coaches refitted for restored through service between Britain, Holland, and Central Europe

The "Rheingold Express" between the Hook of Holland (in connection with the Harwich-Hook steamer service), Amsterdam, Cologne, Bonn, Mainz, South Germany, Switzerland, and Austria was re-introduced last summer, as recorded in our issue of May 25, 1951. New stock has been provided, but the German Federal Railways have not found it possible to operate this train with saloon-type stock (first and second class only) in use before the war. Present traffic requires accommodation for all three classes. The new

and coconut matting. The lavatories have been completely overhauled, all fittings replated, and the walls and ceilings painted light green. All coaches are electrically heated.

The exterior finish is blue picked out with narrow silver lining. The words "Deutsche Bundesbahn" appear below the exterior waist line in raised metal letters 8 in. high. The roof is painted silver grey, with inscriptions on the end panels (coach weights, seating capacity, and so on) in the same colour.



Reconditioned third class coach in southbound "Rheingold Express" at Cologne Main. On right of train indicator is illuminated "Bremsprobefahrplan" panel giving brake test and other signals to train crew and platform staff

stock consists of semi-streamline stock built in 1938 and newly reconditioned.

The coaches are equipped with bogies of the lightweight Görlitz III type, which provides for quadruple springing and roller bearings. Experience has shown that this type of bogie ensures particularly smooth and silent running.

Redecoration of Compartments

All interior woodwork was renewed. The interior panelling up to the waist in first and second class compartments and in the corridor of the upper class sections of coaches was lined with grey striped plush; brown synthetic leather or grey linoleum was used for the same purpose in third class compartments and corridors. Seats have been re-upholstered with green plush in first, with standard grey striped plush in second, and with green synthetic leather in third class compartments. It was necessary to renew some third class accommodation with tubular steel frame seats. Antimacassars are provided for head rests.

Lighting equipment, and fittings such as luggage racks, ash trays, door locks, and so on, were renewed and re-plated and are of a standard pattern. Carpet runners have been provided in compartments and corridors. The entrance vestibules are fitted with footscrapers of metal grillwork

The brakevans are provided with side corridors, which is a departure from normal German practice, as the vans are usually marshalled at the end of the trains, and not traversed by passengers. Postal compartments, as well as separate compartments for international baggage in transit, are provided. The corridors are lined with synthetic leather to the waist and with green linoleum above.

Restaurant cars, provided and operated by the International Sleeping Car Company, also are painted to conform with coaches and vans.

In addition to the "Rheingold Express," a new limited train, the "Rhine Arrow" is to be introduced next summer between the Hook of Holland and Basle, on a fast schedule approximating to that of the prewar "Rheingold Express."

PROGRAMME OF RAILWAY FILMS.—Films on railway subjects including "The Great Train Robbery," "The Blue Express" (a Russian film), and the opening sequence of "La Bête Humaine" will be shown at the Scala Theatre, Charlotte Street, London, W.1., on Sunday, January 27, beginning at 3.30 p.m. The programme is under the auspices of the New London Film Society and tickets may be obtained through members of the Society.

Contracts & Tenders

The order for 240 bodies and underframes for open goods-wagons, which was placed with the Metropolitan-Cammell Carriage & Wagon Co. Ltd. by the Commonwealth Government Railways, Australia, last year, has recently been increased to 340.

The Indian Government has placed the following further contracts under its 1952-53 programme:—

Alti Forni e Acciaierie D'Italia—Illva, Genoa, Italy: 7,100 pairs of wheels and axles
Navalmecanica S.p.A. Naples, Italy: 20 20-ton cranes
Unione Costruttori e Riparatori, Milan, Italy: 150 four-wheel brakevans

An outcome of a recent visit to Germany by Mr. D. Herlihy, Chief Engineer, Coras Iompair Éireann, and Mr. P. T. Somerville-Large, Deputy Chief Engineer, has been the placing of an order for 2,000 tons of rails with Stahlunion-Export G.m.b.H., Düsseldorf, by C.I.E. The purchase of these rails, and an order for 750 tons placed with the Workington Iron & Steel Co. Ltd., enough for 20 miles of track, will enable the C.I.E. permanent way renewal programme to be carried out in full in the financial year ending March, 1953, and will, with the arrival of supplies ordered some time ago, allow the creation of an emergency stock.

The German rails suit C.I.E. 1952 flat-bottom standard and may be used with sole-plates and fasteners on hand. They are not, however, of standard section in profile and special fishplates will have to be supplied.

C.I.E. has stated that the necessity for seeking rails on the continent was brought about by the control restrictions on the export of steel from Great Britain.

A recent report from the Board of Trade Special Register Information Service stated that the closing date of the call for tenders (No. B.E. 2494) issued by the State Railways of Thailand, for 100 all-steel bogie carriages, complete with all equipment and fittings, has been extended from December 24, 1951, to January 24, 1952. The tender was previously referred to in our November 23 issue.

The Government of Pakistan is inviting tenders for the supply of 176,000 broad gauge wooden sleepers, 500 cu. ft. of bridge timbers, and 10,700 cu. ft. of crossing timbers, of sizes required by the North Western Railway during 1952-53. Further details are given under Official Notices on page 55.

According to a report by the Board of Trade Special Register Information Service, the closing date of the call for tenders (No. 260/51) issued by the Permanent Purchasing Commission, Treasury Department, Lourenço Marques (on behalf of the Ports, Railways & Transport Department), for rails and accessories, has been extended from 3 p.m. on December 27, 1951, to 3 p.m. on February 29, 1952. The tender was referred to in our December 7 issue.

The Special Register Information Service of the Board of Trade, Commercial Relations & Exports Department, recently contained a report from Antananarivo that the Director of Mining Services of the Sakoa Coalfield, Madagascar, wishes to purchase 6-8 diesel locomotives of 60-cm. gauge for use both below and above ground. United Kingdom manufacturers should send details

of their equipment to the British Consulate General, Antananarivo, Madagascar, who will transmit them to the Director of Mining Services.

The Board of Trade Commercial Relations & Exports Department, Special Register Information Service, recently stated that a call for tenders has been issued by the Commonwealth Railways, Australia, for the manufacture, supply and delivery of steel dogspikes (specification W & W No. 533) and steel fishbolts with nuts (specification W & W No. 534) as follows:—

2,237,200 steel dogspikes $\frac{3}{4}$ in. square by 5 in. long, as per E.W.W. sketch No. 376 weighing approximately 940 tons

170,000 steel dogspikes $\frac{3}{4}$ in. square by 5 in. long, as per E.W.W. sketch No. 356 weighing approximately 50 tons

61,000 steel fishbolts with nuts of a dia. of 1 in. by $5\frac{1}{2}$ in. long, weighing approximately 56.5 tons

41,000 steel fishbolts with nuts of a dia. of $\frac{7}{8}$ in. by $4\frac{1}{2}$ in. long, weighing approximately 25 tons

Tenders should reach the Secretary, Commonwealth Railways, Melbourne, C.I., before 4 p.m. on January 22. A copy of the specifications is available for inspection by representatives of United Kingdom manufacturers at the Board of Trade.

AUTOMATIC TELEPHONE & ELECTRIC CO. LTD.—It is proposed to increase the capital of the Automatic Telephone & Electric Co. Ltd. to £3,560,000 by the creation of 1,000,000 ordinary shares of £1 each. Subject to the permission of the C.I.C. the directors propose, when conditions are most favourable, to make an issue to ordinary and deferred stockholders of a proportion of the amount to be authorised.

Notes and News

Channel Islands Air Traffic.—A record of 217,771 passengers travelled by British European Airways between mainland airports and the Channel Islands during 1951.

Railway Students' Association.—The 1952 Convention of the Railway Students' Association, London School of Economics & Political Science, will be held at the University of St. Andrews, Fife, Scotland, from June 20 to 24.

Vacancy for Engineer.—A young engineer, with commercial experience or leanings, or alternatively a young commercial man with technical leanings, is required for work overseas after training period. See Official Notices on page 55.

Railway Efficiency Committee.—Meetings of the Special Joint Committee established in February, 1951, to effect economies in manpower, on which both management and men are represented, have been suspended indefinitely. Informal talks between railway officials and union representatives are being held instead.

German Wagons Held in Poland.—An agency message states that Poland has refused to return to East Germany an estimated total of 8,000 German wagons and over 400 locomotives left over since the end of the war. Negotiations have been continuing in Poland since last November. The Polish authorities would be ready to return the wagons, it is reported, only if East Germany delivered new wagons in replacement.

Repairs to Hastings Tunnel.—During repairs, Hastings Tunnel, between St. Leonards Warrior Square and Hastings Stations, will be closed on Sunday.

Presentation to Mr. H. H. Halliday



Mr. H. H. Halliday (left), until recently Regional Staff Officer, Eastern Region, receiving from Mr. C. S. McLeod, the new Regional Staff Officer, a presentation from the staff

January 13; single-line working will be necessary for some weeks thereafter, and eastbound trains will reach Hastings a few minutes later, and westbound trains leave earlier than now scheduled. Bopeep Tunnel, between Bopeep Junction and Warrior Square, was closed for major repairs for several months in the winter of 1949-50.

Liquidation of Leopoldina Companies.—Resolutions to place the Leopoldina Railway Co. Ltd. and the Leopoldina Terminal Co. Ltd. in liquidation were passed at meetings of the two companies held on December 27. The business of the meetings was purely formal.

Institution of Electrical Engineers.—At a meeting of the Institution of Electrical Engineers, Savoy Place, London, W.C.2, to be held at 5.30 p.m. on January 21, Mr. C. M. Cock, General Manager, Traction Department, English Electric Co. Ltd., will open a discussion on "The Implications of the Railway Electrification Committee's Report, 1950."

Eastern Region Winter Traffic Position.—In addition to the three notices mentioned in our January 4 issue, the Signal & Telecommunications Engineer of the Eastern Region has brought out another bulletin intended to encourage the staff to greater efficiency. It asks members of the staff to consider whether past failures were avoidable and whether wagons could have been released earlier. The "immediate job is to see the winter traffic through." The notice states that 500 new 16-ton mineral wagons have been diverted to carry bulk sugar from East Anglian factories to Silvertown Refinery.

Miners' Cap Lamps in Motive Power Depots.—British Railways are to extend the use of miners' cap lamps which have been tried out experimentally by staff engaged in examining locomotives and boilers at motive power depots. The lamps leave the men with both hands free to do

their job and at the same time enable them to direct the light where it is most needed. Small batteries are carried on the belt to supply current to the lamps, which are fitted with switches to enable a beam or a diffused light to be used as required.

British Railways Wagons for Synthetic Soap Products.—British Railways are to build 180 25-ton covered hopper wagons of a special type to carry sodium tripolyphosphate and soda ash in bulk from Cheshire to factories in the north west and eastern counties. Some 125,000 tons of this traffic is involved annually and will be used in the manufacture of synthetic soaps and other cleaning materials.

Delay Through Passengers Alighting on Line.—When an up Tilbury line (Eastern Region) train broke in two near Shadwell Station, about 1½ miles east of Fenchurch Street, in the morning peak traffic period on January 3, passengers of this and following trains stopped by signal alighted on the track, and walked to the platforms. Other trains which were able to get through were led by railway officials, who warned passengers who were picking their way along the line, but much delay was caused through stops and slow running to avoid running down passengers on the line. It is stated that had passengers remained in the coaches after the original mishap, working of the rear half of the divided train into Fenchurch Street would have caused only some 10 min. delay to traffic.

Exhibition Models at Railway Executive H.Q.—A selection of models of British Railways locomotives and rolling stock, and other display features not currently required for exhibition purposes elsewhere, is being placed on view in the main hall of the Railway Executive headquarters at 222, Marylebone Road, London, N.W.1. The items are changed frequently and thus, as well as giving appropriate embellishment to the impressive entrance hall, may always be of interest to visitors and others using the building. Recent exhibits

included "Royal Scot" class 4-6-0 express passenger and Class "8F" 2-8-0 freight locomotives, four examples of freight wagons built for special traffic, and cases showing a British Railways high-speed track relaying unit and a former L.N.E.R. first class sleeping car.

Eastern Region Station Closing.—On February 4 the Eastern Region of British Railways is closing Whittington Station to regular passenger train traffic. Facilities for passengers are available at Chesterfield (Midland and Central) and parcels will be dealt with at Barrow Hill Station. There are frequent bus services in operation in the area.

B.E.T.R.O. to Wind Up.—The British Export Trade Research Association is to recommend a members' voluntary winding up, as the demand for market research services has not proved sufficient and the organisation has not achieved a sufficient turnover to enable it to pay its way. B.E.T.R.O. was established in 1945 on a non-profit-making basis to assist in the recapture of overseas markets by preparing surveys.

Midland Railway Company of Western Australia.—Arrears of interest on the second mortgage income debenture stock of the Midland Railway Company of Western Australia for the six months to June 30, 1948, is to be paid on March 31. Gross receipts for the year ended June 30, 1951, amounted to £395,729, against £299,665, and working expenses to £352,266, against £235,980. After providing for renewals, depreciation, and tax, there remains £13,434, against £13,593, of which the debenture arrears require £11,847 as before.

Closing of L.M.R. Goods Depots.—As from January 21 the Downholland branch of the London Midland Region between Hillhouse Junction and Southport will be closed. Goods depots affected will be Kew Gardens, Shirdley Hill, Halsall, and Downholland, and alternative arrangements for parcels and passenger train merchandise have been made. Parcels for despatch will be collected on receipt of a request at Southport (Chapel Street) Station and Ormskirk Station and alternative arrangements have been made for handling freight train traffic.

Public Transport Association.—The 1952 conference of the Public Transport Association is being held at Torquay between April 29 and May 1. The conference headquarters will be at the Palace Hotel, where all the business sessions and other functions will be held, except for the civic reception on May 1, which will be in the Town Hall. The programme includes an informal reception by the Chairman and Vice-Chairman of the Council on April 29, official welcome by the Mayor of Torquay; annual general meeting, paper and discussion, and annual dinner on April 30; and a paper and discussion, and civic reception on May 1.

Permanent Way Institution.—The 68th annual winter meeting of the Permanent Way Institution will be held at the Institution of Civil Engineers, Great George Street, Westminster, S.W.1, on January 26. The chair will be taken at 2.30 p.m. by Lt.-Colonel H. B. Everard, President of the Institution, and Chief Officer, Engineering (Maintenance), Railway Executive, and following the General Meeting, Mr. M. Janes, Secretary, will give a paper on



Fitter working in a locomotive inspection pit by the aid of a miner's cap lamp

OFFICIAL NOTICES

WE buy used or unserviceable Steel Files at good prices on lots of 2 cwt. or more.—THOS. W. WARD LTD., Reusable Steel Dept., Albion Works, Sheffield.

NOTICE is hereby given that Exors. of James Mills Ltd. seek leave to amend the Complete Specification of Patent No. 437,189 for an invention entitled "Improvements in Railway and Tramway Rail and Wheel Flange Lubrication." Particulars of the proposed amendments were set forth in the Official Journal (Patents), No. 3282, dated 9th January, 1952. Any person may give Notice of Opposition to the amendment by leaving Patents Form No. 36 at the Patent Office, 25, Southampton Buildings, London, W.C.2, on or before 9th February, 1952.

TRACTION Motor Draughtsmen and Designer Draughtsmen required by manufacturers of diesel electric locomotives. A sound knowledge of the mechanical as well as the electrical design of traction motors is essential and applicants should have a wide experience of modern design and production methods in this class of work. Good salaries will be paid to men having these qualifications and special consideration will be given to other problems connected with the engagement of Senior Staff. Three years' agreement and every facility to find suitable living accommodation will be given. Please apply giving full details of training, experience, age, etc., to Box 322, *The Railway Gazette*, 33, Tophill Street, London, S.W.1.

JUST PUBLISHED—Twenty-Five Years of the North Eastern Railway, 1898-1922. By R. Bell, C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10s. 6d.—*The Railway Gazette*, 33, Tophill Street, London, S.W.1.

Forty Years as Corresponding & General Secretary, Permanent Way Institution. The annual winter dinner, at which Lt. Colonel H. B. Everard will preside, will be held at the Railway Executive headquarters, 222, Marylebone Road, N.W.1, at 5.45 for 6.15 p.m.

Highland Transport Co. Ltd.—The British Transport Commission, which has held a 50 per cent. financial interest in the Highland Transport Co. Ltd., recently has acquired the remaining interest. The Highland Transport Co. Ltd. has purchased the passenger road transport section of the business of Macrae & Dick Limited and will operate the local stage carriage and touring services hitherto carried on by that company. In addition, certain local services operated by W. Alexander & Sons Ltd., including the Inverness Town Service, will come under the control of the Highland Transport Co. Ltd. Mr. James Amos, Chairman of the Scottish Omnibuses Group, will be the new Chairman of the Company, and Sir Hugh Mackenzie will continue as a director.

Notice of Track Closing: Inquest on Ganger.—At a recent inquest on a ganger killed by a train while working on the line, the jury expressed the opinion that British Railways had been negligent in not seeing that a notice of the closing of a track to traffic was delivered to the person concerned in a more suitable manner. A verdict of accidental death was returned. The Coroner said the deceased was one of a gang working on the line under the impression that both tracks were closed to traffic. Because of failure here, there, and in a third place, a notice ordering both tracks to be closed was not delivered to the signalman.

Experimental Running of Braked Coal Wagons.—The London Midland Region train of vacuum-braked coal wagons referred to in an editorial note in this issue left Toton at 9.33 a.m. on January 6, and reached Brent yard at 1.09 p.m. The route was via Trent, Loughborough, the spur at Syston, Melton Mowbray, Manton, and Wellingborough, at which last point the train stopped 15 min. The running time

GOVERNMENT OF PAKISTAN Ministry of Communications (Railway Division). Tenders are invited for the supply of 176,000 Nos. B.G. Wooden Sleepers (size 9' x 10' x 5'), 500 c.ft. Bridge Timbers and 10,700 c.ft. Crossing Timbers of sizes required by the N.W. Railway during the year 1952-53. Tender documents including instructions to tenderers, tender form, schedule of requirements, specifications, standard conditions of contract and special conditions of contract can be obtained from the Commercial Secretary, Supply and Stores Department, Office of the High Commissioner for Pakistan in U.K., 40, Lowndes Square, London, S.W.1, on payment of £2.10.0 for each set which amount will not be refunded. Tenders in sealed covers superscribed "Tender for Wooden Sleepers" should be submitted direct to the Director General, Railways, Ministry of Communications, Railway Division, Government of Pakistan, Karachi, so as to reach him before 11.00 hours on 20th February, 1952. Tenders will be opened in the office of the Director Mechanical Engineering and Stores, Railway Division, at 11.00 hours on 21st February, 1952, in the presence of any tenderers who may care to be present. The Director General, Railways, reserves to himself the right to reject the lowest or any tender without assigning any reason therefor and may accept any tender in part. This call is being made simultaneously in Pakistan, London, Washington and India.

THE "PAGET" LOCOMOTIVE. Hitherto unpublished details of Sir Cecil Paget's heroic experiments. Eight single-acting cylinders with rotary valves. An application of the principles of the Willans central-valve engine to the steam locomotive. By James Clayton, M.B.E., M.I.Mech.E. Reprinted from *The Railway Gazette*, November 2, 1945. Price 2s. Post free 2s. 3d. *The Railway Gazette*, 33, Tophill Street, London, S.W.1.

JUNIOR CIVIL ENGINEER required for maintenance and general construction work on the Central Railway of Peru (a mountain railway); residence would be at an altitude of 12,000 feet. Single man of about 24 to 26 years of age preferred. Railway experience and/or knowledge of Spanish desirable but not essential. Apply to the Secretary of THE PERUVIAN CORPORATION LTD., 144, Leadenhall Street, London, E.C.3.

LOCOMOTIVE, Carriage and Wagon Senior Draughtsman, 30/35 years of age. Qualifications: Must have served a full general apprenticeship in an engineering workshop (preferably railway) and have had at least five years Drawing Office experience with some time in an executive capacity. A knowledge of Spanish an advantage. Future prospects. Apply to the Secretary, PERUVIAN CORPORATION LTD., 144, Leadenhall Street, London, E.C.3.

YOUNG ENGINEER wanted with commercial experience or leanings, or alternatively, young commercial man with technical leanings, for work overseas after training period. Applicant should be ambitious young man anxious to get on, and a good mixer. Work involves sale of engineering products to plantations, mines, contractors, etc., and offers excellent career to right man. Send typed application, with photograph, which will be returned, to Box 9325, FROST-SMITH ADVGS., 64, Finsbury Pavement, London, E.C.2.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tophill Press Limited, 33, Tophill Street, London, S.W.1.

The latest iron and steel figures show that 203,912 tons were conveyed during the week ended December 22.

Clyde Steamer Services.—The curtailed Clyde steamer service, which came into operation on January 7, and the subject of local protest, as recorded in last week's issue, is to be readjusted. On January 14, a new winter timetable restoring steamer calls to Kilm and possibly Largs will be introduced, and the position of Hunter's Quay will be reconsidered immediately. This was announced in Glasgow after a meeting on January 7 of Clyde Coast Burgh representatives and railway officials under the chairmanship of Mr. Thomas Johnston, Chairman of the Scottish Tourist

G.N.R.(I.) Christmas Window Display



A Christmas display in the window of the G.N.R.(I.) city office in Dublin. The "Progress with Enterprise" section (left), which is permanent, contrasts the "Enterprises" team carriage of 1833 and the G.N.R.(I.) "Enterprise" express of today

Board. The *Countess of Breadalbane*, an all-weather vessel, is to be brought from Loch Awe to supplement the Clyde steamer services. The Clyde representatives will meet the railway officials again on January 21 to discuss summer services.

Cleveland Bridge & Engineering Co. Ltd.—For the year ended September 30, 1951, the manufacturing profits of the Cleveland Bridge & Engineering Co. Ltd. amounted to £130,598, against £114,306, and the net profit, after tax, to £56,525, against £42,013.

Forthcoming Meetings

- January 14 (Mon).—Institute of Transport, in the Jarvis Hall, 66, Portland Place, W.1, at 5.45 p.m. "Transport and the Tourist Industry," by Mr. E. L. Taylor, Executive, British Electric Traction Co. Ltd., and Deputy Chairman, British Travel & Holidays Association.
- January 15 (Tue).—Institute of Metals. South Wales Local Section, at the University College, Metallurgy Department, Singleton Park, Swansea, at 6.30 p.m. "Metallurgy and Transport," by Mr. T. Henry Turner.
- January 15 (Tue).—Institute of Transport, Metropolitan Graduate & Student Society, at 80, Portland Place, W.1, at 5.45 for 6.15 p.m. "The Conveyance of Exceptional Loads by Rail," by Mr. J. R. W. Kirkby.
- January 16 (Wed).—South Wales & Monmouthshire Railways & Docks Lecture & Debating Society, in the Angel Hotel, Westgate Street, Cardiff, at 6.30 p.m. "The National Dock Labour Scheme for Docks; its History and Operation," by Mr. A. E. H. Brown, Chief Docks Manager (South Wales Docks), Cardiff.
- January 16 (Wed).—Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, Storey's Gate, S.W.1, at 5.30 p.m. "New Steel Electric Railway Stock for the Indian Government Railways," by Messrs. S. E. Lord, J. F. Thring, and H. H. C. Barton.
- January 17 (Thu).—British Railways, Southern Region, Lecture & Debating Society. Visit to *News Chronicle*, Bouverie Street, E.C., at 9.15 p.m.
- January 17 (Thu).—Diesel Engine Users Association, at Caxton Hall, Westminster, S.W.1, at 2.30 p.m. "Recent Experiences in the Lubrication of Oil Engines," by Mr. L. J. Izard.
- January 17 (Thu).—Permanent Way Institution, London Section, at the Railway Executive headquarters, 222, Marylebone Road, N.W.1, at 6.30 p.m. "The Effect of Time on Railway Maintenance," by Mr. B. P. Fletcher.
- January 17 (Thu).—British Railways, Western Region, London Lecture & Debating Society, in the Clerks' Dining Club, Bishops Bridge Road, W.2, at 5.45 p.m. "Modern Methods of Storekeeping," by Mr. H. R. Webb, Stores Superintendent, Western Region.
- January 18 (Fri).—Royal Dublin Society, Balls Bridge, Dublin, 3 p.m. "To the Clouds by Train—Railway Engineering in the Bernese Oberland," by Mr. Cecil J. Allen.
- January 19 (Sat).—Permanent Way Institution, Manchester & Liverpool Section, in the Liverpool Technical College, Byrom Street, Liverpool, at 2.30 p.m. "Maintenance and Renewal of Track in Tropical Africa," by Mr. F. Humberstone.

Railway Stock Market

Stock markets were held in check by the latest decline in gold and dollar reserves, which, combined with the balance of payments position, suggest that later this month the London Conference of Commonwealth Finance Ministers will have important decisions to make. The prevailing view is that some reduction in imports of goods from the U.S.A. may be necessary to save dollars. The City has not been surprised by the warning given by Mr. Butler of a stiff Budget next April because it has been generally assumed that in existing conditions and with rearmament demands to meet there is little scope for tax concessions. Prevailing belief continues that E.P.T. is likely to be at 100 per cent. on profits in excess of the average for the past three years, and this will bear heavily on many companies benefiting from rearmament or export trade, leaving little room for higher dividends. Under the circumstances it may be surprising that stock markets continued to maintain a fairly steady tendency.

In the case of British Funds it is argued that the moves against inflation, and the strengthening of the £ abroad, must in time benefit sentiment in regard to gilt-edged stocks, and that they may in due course recover much of the ground lost during the past three months, provided there is no further increase in the Bank rate. In general it would seem that uncertain conditions may remain in stock markets until after the Budget. Nevertheless it is possible that in the event of favourable news as to the outcome of Mr. Churchill's visit to the U.S.A., markets might respond strongly if buying interest revives.

Because of uncertainty at home there is a tendency for interest to increase in overseas securities, and as a result foreign rails have been rather more active this week, though best prices were not held. Antofagasta preference stock attracted around 73 and the ordinary was up to 19. The market hopes there will soon be a further payment in respect of outstanding preference dividend arrears. The main reason for the buying of Antofagasta stocks however is the continued assumption that in due course a scheme will be devised for funding all preference arrears. Taltal shares have also been more active, and moved higher at 19s., though Nitrate Rails eased to 23s. 6d. San Paulo eased to 15s. 3d. on

continued fears that it will be a long while before there is a final decision on the additional compensation claims.

Another active stock has been Mexican Central "A" debentures, which at 83 show a substantial profit to those who purchased in the first part of 1951, and are being talked still higher in the market, though at their current price, fluctuations must be expected. Canadian Pacifics at \$71 have not held best levels, but remained active in common with other Canadian securities which have been in renewed demand on Wall Street. Canadian Pacific 4 per cent. preference at 66½ has been in rather better demand because the yield seems attractive even allowing for the fact that the dividend in non-cumulative Canadian Pacific 4 per cent. debentures firmed up to 81. In other directions Leopoldina stocks held steady with the ordinary at 10½, the preference 28½, and 6½ per cent. debentures 150, while Leopoldina Terminal 5 per cent. debentures were 104½ and the ordinary units 1s. 9d. Manila "A" debentures were 74½ and the 5 per cent. preference shares 8s. 3d.

Road transport securities held steady with Southdown at 96s., Lancashire Transport 53s. 9d., and West Riding 43s., while B.E.T. deferred stock became more active around £445.

In the engineering and allied sections movements have been small and irregular. John Brown were prominent up to 47s. 3d. on market talk of higher dividend possibilities. Vickers have been firmer at 46s., while Babcock & Wilcox (70s. 9d.) have been inclined to rally, though elsewhere Guest Keen (53s. 6d.) failed to hold all a previous gain. T. W. Ward at 72s. also eased. Sentiment in regard to engineering and allied shares has been affected by the steel position, although it is realised that in many cases reduced supplies for normal work will be offset by larger supplies for rearmament and kindred activities, and in general it is believed that there are good prospects of dividends being maintained.

Among shares of locomotive builders and engineers Hurst Nelson eased slightly to 56s. 3d. at Glasgow. Birmingham Carriage were 35s. 4½d., Beyer Peacock 32s. 1½d., and Gloucester Wagon 14s. 3d., while North British Locomotive eased to 17s. 3d. Vulcan Foundry were 23s. 9d., Wagon Repairs 5s. shares 10s. 6d. xd., and Charles Roberts 22s. 6d.

Traffic Table of Overseas and Foreign Railways

	Railway	Miles open	Week ended	Traffics for week		No. of week	Aggregate traffics to date	
				Total this year	Inc. or dec. compared with 1949/50		Total	Increase or decrease
							1950/51	
South & Cen. America	Antofagasta ...	811	28.12.51	£ 139,920	+ £ 42,950	52	£ 6,526,260	+ 2,836,756
	Costa Rica ...	281	Oct., 1951	£1,244,055	+ £228,863	18	£4,947,302	+ £586,239
	Dorada ...	70	Nov., 1951	33,765	- 3,207	48	394,882	- 33,323
	Inter. Ctl. Amer. ...	794	Nov., 1951	\$1,039,455	- \$19,932	48	\$11,978,007	- \$282,812
	Paraguay Cent. ...	274	28.12.51	/ 289,547	+ £102,688	26	/ 8,823,911	+ £3,556,978
	Peru Corp. ...	1,050	Dec., 1951	\$8,471,000	+ \$1,124,000	26	\$49,271,000	+ \$3,141,000
	" (Bolivia Section)	66	Dec., 1951	Bs.19,282,000	+ Bs.5,954,000	26	Bs.95,087,000	+ Bs.25,173,000
	Salvador ...	100	Oct., 1951	£114,000	+ £27,000	18	£495,000	+ £140,000
	Taltal ...	147	Nov., 1951	\$2,177,000	+ \$155,600	22	\$10,120,000	+ \$2,298,300
	Canada	Canadian National	23,473	Nov., 1951	18,035,000	+ 403,000	48	190,178,000
Canadian Pacific ...		17,037	Nov., 1951	12,638,000	+ 938,000	48	131,106,000	+ 16,187,000
Various	Barsi Light* ...	167	Nov., 1951	37,957	+ 6,607	33	284,050	+ 48,667
	Egyptian Delta ...	607	10.4.51	17,513	- 267	4	17,513	- 267
	Gold Coast ...	536	Sep., 1951	178,087	- 44,028	21	1,458,732	+ 69,355
	Mid. of W. Australia ...	277	Oct., 1951	72,767	+ 30,311	48	242,663	+ 89,350
	South Africa ...	13,398	8.12.51	2,077,142	+ 200,674	36	69,034,703	+ 7,489,556
	Victoria ...	4,744	Sep., 1951	1,809,949	+ 80,605	13	—	—

* Receipts are calculated at 1s. 6d. to the rupee

† Calculated at \$3 to £1